

The Commercial Car Journal

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The Motor Truck in Telephone Service



Motor Equipment Ranges From a "Mosquito Fleet" to the Fully Equipped Ten Thousand Pound Truck. Trailers Used With Success

By C. L. EDHOLM

MOTOR delivery efficiency is peculiarly well demonstrated in the service of the New York Telephone Co., as the problems are many and varied. The loads carried run from a one-pound article that must be delivered with speed, to a trailer load of poles or a reel of cable weighing 4200 lbs., and therefore the commercial cars used by the company include 10,000 lb. trucks, lighter cars carrying from 1000 to 6000 lbs. and delivery wagons that handle loads from 750 lbs. to half a ton. In addition there is a "mosquito fleet" of runabouts, motorcycles (with and without side cars) and bicycles, every vehicle being adapted to some special need.

These machines operate over an area of about 1500 square miles, including the congested streets of Manhattan and the suburbs extending over Long Island, up and into New Jersey. In this district there are four thousand telephone men, constantly on the job, crews or single workers, whose work requires them to move from place to place frequently, so that the transportation of this force alone is a big problem.

The road conditions vary likewise, with difficulties ranging from the deep sand of

country roads to the crowded traffic of the streets down town, and the weather conditions are all that New York climate has to offer in the way of blizzards and blistering heat, for the telephone business is one that has to continue through all weathers, and a big storm merely means more activity among the repair men.

The transportation problems, indicated briefly, have been met with complete success by this big company, with the aid of the wonderfully adaptable motor vehicles so essential to twentieth century business.

To secure economy in handling the nine thousand kinds of material used in the telephone plant there are several warehouses and supply depots in different parts of the metropolitan area, and 54 such warehouses and 180 central offices at points convenient for distribution. Therefore there is a wholesale delivery system, making use of cars of from 1½ to 5 tons capacity, which permits transporting full loads from the central warehouse to the sub-stations. Included in the wholesale operations is the moving of consignments of poles, cables, etc., from the nearest railroad terminal to the construction work in which they are required. For extensive jobs the freight

shipments are so arranged as to allow the materials to reach the railroad terminals about when needed, so that they need not remain in storage.

The retail distribution consists of the delivery of unit packages to the subscriber's home or office, where the telephone is to be installed. For this the 750 to 1500-lb. cars are utilized. The range of costs varies therefore remarkably, being as low as 8 cents per ton-mile for wholesale delivery and as high as \$3.75 for retail delivery. The figures for 1915 indicate the extent of the transportation business operated by this company: Deliveries from the central warehouse numbered 110,000; the weight of materials handled was 10,700 tons and the number of miles traveled 161,000, requiring the services of fifteen trucks.

Transportation costs are minimized by applying to each service the most economical and efficient type of vehicle, thus the "trouble men," the inspectors and the men who install instruments have bicycles for work in the congested area, where the trips are short and the total number of miles is small. About 300 bicycles are so used, while more than 200 motorcycles and 30 more with side cars are employed for similar work. Motorcycles operate in the less

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thickly populated sections where the distances between jobs are greater. With the side cars, an extra man and considerable material may be carried.

The lightest automobile used is the Ford runabout for supervisory work. Simplicity of mechanism, reliability, light weight and cheapness are the requisites for this service, and 218 runabouts and 15 Ford delivery cars are in use for inspection trips and light delivery. For the latter the runabouts may be fitted with box bodies, and as convertible cars give double service.

Next come the 1000-lb. delivery cars, ten Vim delivery wagons, while among the 1500-lb. machines are 23 Stewarts and three other makes, a total of 36. The delivery

a day. They carry much of the material required on such jobs as well as the laborers and their tools.

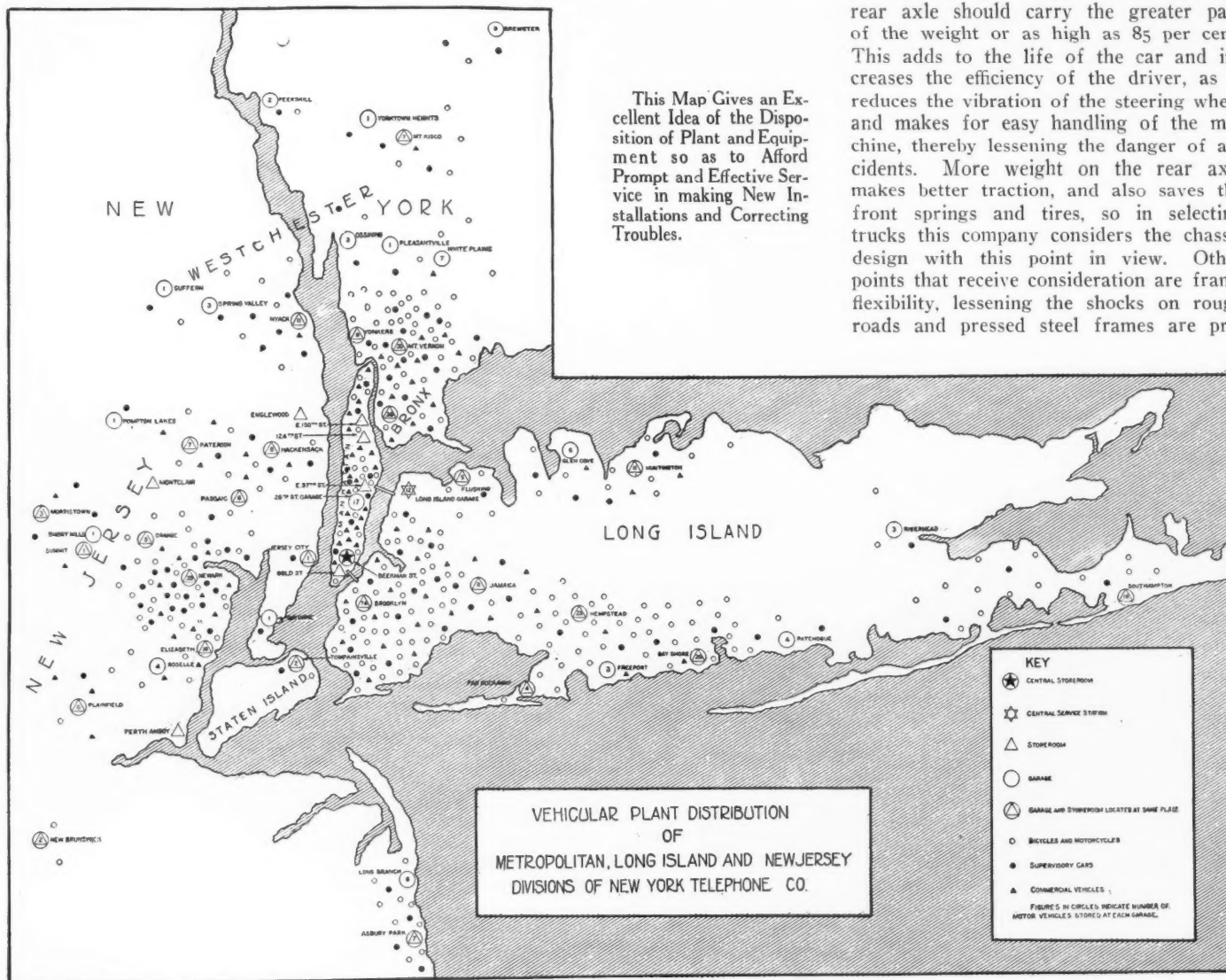
Among the medium weight trucks, ranging from one to two tons, are 33 Macks, 13 Pierce-Arrow 2-ton trucks and 7 other makes, a total of 53.

In the heavy trucks with their trailers, power winches and other special appliances the telephone people have exercised ingenuity to develop machines to serve their particular needs. Six are Mack 6000-lb. trucks, while the rest are 10,000 lb. cars, ten Pierce-Arrows, two Mercedes and one Hewitt.

Economical transportation is the chief requirement for the heavy weights. Speed

to the door of a freight car. By removing the rear sections of the racks on both sides it is possible to install a fifth-wheel bumper on the platform for attaching trailers. Boxes beneath the platform or at the sides hold tools and skid boards are carried on supporting irons underneath. Thus the platform space is left available for transporting gangs of laborers and bulky material. The floor space on the 4000-lb. trucks is 10½ ft. long and from 43 in. to 6½ ft. wide, governed by the dimensions of the chassis. The 10,000-lb. trucks have a clear floor space of 13 x 6½ ft., accommodating two reels of cable side by side.

Importance is attached to the balancing of the load in the heavy duty trucks. The rear axle should carry the greater part of the weight or as high as 85 per cent. This adds to the life of the car and increases the efficiency of the driver, as it reduces the vibration of the steering wheel and makes for easy handling of the machine, thereby lessening the danger of accidents. More weight on the rear axle makes better traction, and also saves the front springs and tires, so in selecting trucks this company considers the chassis design with this point in view. Other points that receive consideration are frame flexibility, lessening the shocks on rough roads and pressed steel frames are pre-



cars have enclosed panel type bodies, to keep the contents dry. They make from forty to sixty deliveries a day within a 25-mile route and carry small loads, averaging from 1 to 20 lbs. to each delivery point.

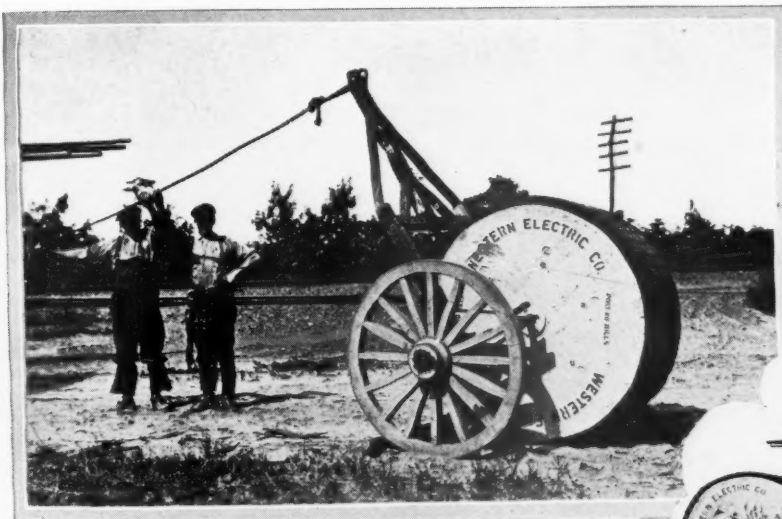
For the cars ranging from 1500 to 4000 lbs. capacity, three types of bodies are used; the panel type closed car, the open express with solid top and the open body with side racks. They are for medium weight deliveries, the two-ton trucks carrying gangs of eight or ten men on construction jobs that require several moves

is secondary and great mileage not demanded as a rule, but power and capacity are of prime importance. They are used for hauling cable, poles and other bulky and heavy material in large lots. The bodies are of the open platform type, with tarpaulin top, which is spread only when weather conditions require it. To keep the floor clear tools are carried in brackets attached to side racks. The racks are in four sections, two on each side and are removable, so that the trucks may be loaded from the side. This is often desirable, as it is not always possible to back up

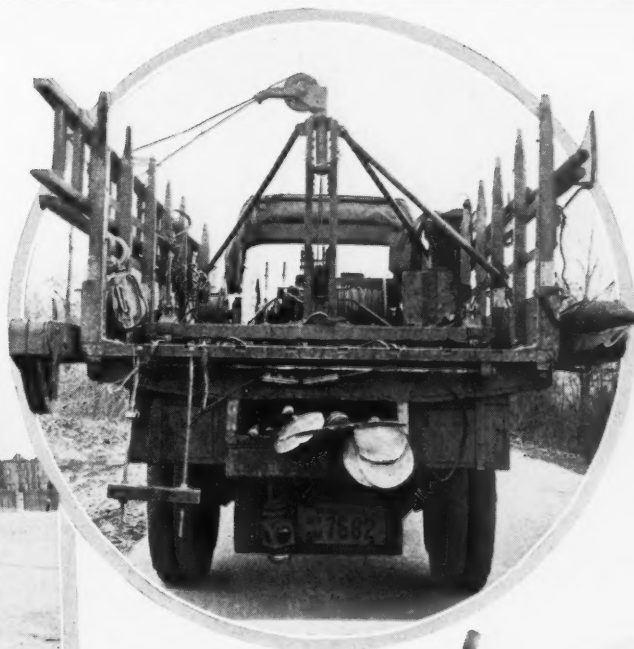
ferred to solid channel construction for this reason. Brakes must be particularly reliable with ample bearing surface. The company shows impartiality regarding the various types of drives, using trucks equipped with bevel gear, internal gear, worm and chain drives.

The value of the trailer is recognized and advantage taken of it so a truck can haul two or three times its rated capacity. For reels of cables and loads of poles the trailer is well adapted, light trucks handling them in this way. Vehicles that could not possibly carry the reels of cable

Trailer and Power Winch Play Conspicuous Part In Telephone Service



Easy Means of Loading the Huge Reel Onto the Tractor. At the Right is the Complete Outfit of Truck and Trailer With Reel as it Appears Ready for the Road. To the Right and Below is a Rear View of a Power-Winch Truck to Show Some of the Equipment Carried.



Easy Means of Loading or Unloading the Huge Reels Entirely Under the Control of the Driver. On the Right is the Power Winch at Work.



on the chassis will haul them easily on a two-wheel trailer, while loads of forty-foot poles, weighing five tons, are handled by medium-weight trucks when the trailer is used. Most of the company's trucks have shackles in the rear for attaching trailers.

The power winch is considered an essential on the heavy trucks and forms part of the equipment of all of them. Each is driven by the power plant of the truck and controlled by the chauffeur without other assistance. Its flexibility allows for the raising and lowering heavy loads at various speeds and for holding such loads suspended. The drum is controlled through friction clutches. For economy's sake the winch is of highest grade material to reduce its weight, as this dead load must be transported thousands of miles in the life of a truck.

The winch is useful not only in telephone work, but enables a truck to pull itself out of ruts and mudholes and act as its own wrecking truck when stalled by bad weather and poor roads. With a thou-

overcome a resistance as high as 12,000 lbs., though the average pull is from 2000 to 4000 lbs.

Two of the company's heavy trucks are equipped for pole work with special winches with three drums, two of which are fitted with contracting-band-type brakes and cone friction clutches and carry $\frac{3}{8}$ -in. steel rope, one 150 ft. and the other 2000 ft. of cable. The third drum revolves with the main winch shaft, but is not controlled by the winch or brake. It carries a detachable outside flange, permitting the removal of coils of rope or wire that may be wound upon it. The other trucks carry a similar winch, except that only one wire rope drum is used with about 2000 ft. capacity. The winch transmissions have two speeds forward and one reverse, and must have a pull of 5000 lbs. at a 6-in. drum radius at a speed of 60 ft. per minute. To provide for the extra strain in starting heavy loads, a safety factor of 1.8 is required.

The inspection, repair and housing of the New York Telephone Co.'s trucks and passenger vehicles is a big undertaking in itself. The metropolitan area is divided

at stated periods. The magnitude of this department's task may be inferred from the following table:

Commercial Vehicles in Service in all Divisions of the New York Telephone Company

Make	Number in Service	Rated Load Capacity, lbs.	Average Monthly Mileage	Average Radius of Operation, miles	Cost per Mile, Gas, Oil, Tires, Repairs
Ford	15	750	1,053	8	\$.073
Vim	10	1,000	961	8	.065
International	3	1,500	779	12	.076
Maccar	2	1,500	1,015	9	.119
Stewart	23	1,500	1,009	20	.068
White	7	1,500			
Chase	3	2,000	515	7	
International	3	2,000	554	20	
Mack	9	2,000	710	12	.132
Autocar	1	3,000	713	10	.078
		3,000			
Mack	24	and 4,000	725	15	.136
Pierce-Arrow	13	4,000		15	
Mack	6	6,000	648	10	.274
Hewitt	1	10,000	604	7	.308
Mercedes	2	10,000	411	15	.112
Pierce-Arrow	10	10,000	1,027	20	.128



Sample of the Large Loads of All Kinds of Equipment Carried by the Heavier Trucks

sand feet of steel cable and a couple of tackle blocks it is able to pull itself out of difficult situations. As ordinarily applied the winch serves, in connection with pole work, pulling cables, aerial and subway and loading and unloading reels weighing from two to five tons each. The winch transmission is available also for operating hydraulic jacks to remove poles, for running a boring machine to dig holes for poles and for operating pumps to drain manholes, and the company is considering the application of some of these devices.

For setting, removing, resetting at different levels or shifting poles with all attachments, the power winch has demonstrated its efficiency, speed and economy. For pulling aerial cables the higher winch speed is used, and a single pull of 2000 ft. is made with a speed of 175 to 200 ft. a minute. The pulling of subway cables requires greater pulling power, and speed is not essential or even desirable. The lower speed of the winch may have to

in three sections, each in charge of an automobile inspector, whose duty is to examine each truck in his division at least once every thirty days. He makes small adjustments, keeps the drivers up to a standard of efficiency and carefulness and reports conditions to the supervisor of motor vehicles. Such repairs as can be handled outside are known as field work and are assigned to men who go out from the central repair shop. They replace carburetors, magnetos, broken knuckles, springs, axles and wheels, while for more extensive work the truck is ordered to the shop by the inspector. To the latter is also assigned the duty of accompanying a new truck until the driver is capable of doing the work.

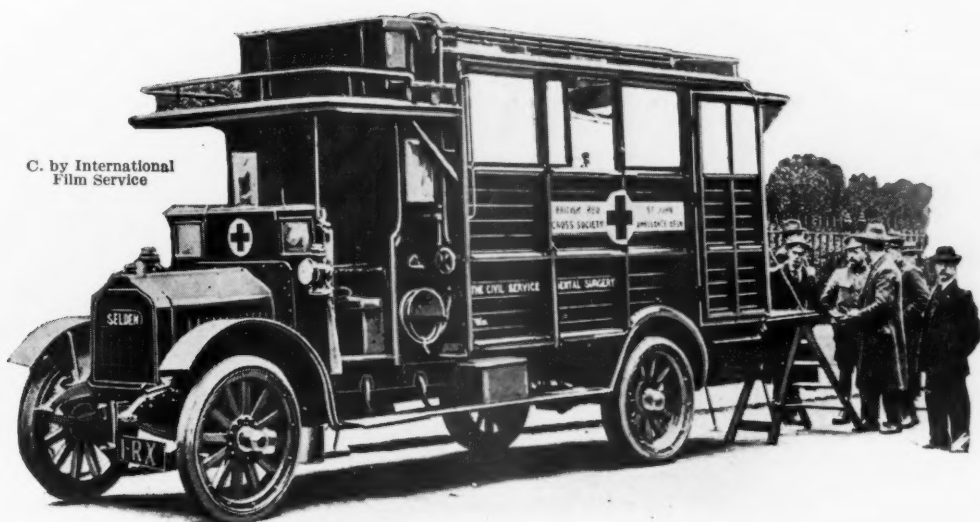
General inspection of the car takes place after it has been in service a year and after the first 20,000 miles have been run the truck receives a general overhauling and such repairs and replacements as are needed. Thereafter it receives similar treatment

In addition to this there are seven touring cars, 218 runabouts and 232 Indian motorcycles to be repaired, inspected and housed.

Garages for the shelter, cleaning and repair of the cars are scattered over the entire area to minimize "dead mileage." In addition to the main service stations at Long Island City there are numerous repair sub-stations in Manhattan, Brooklyn, Newark and Mount Vernon. To avoid loss of time for the machines all the maintenance repair work at the sub-stations is done at night, the driver handing in a report to the garage mechanics of any trouble that needs attention, so that the following morning the machine may be ready for duty. The Long Island City main service station handles the most extensive repairs and carries in stock all the spare parts, units and equipment needed to supply the cars housed in the numerous sub-stations.

This brief resumé of the activities of the transportation department was compiled from facts supplied by the company's engineers, and besides giving some valuable practical information indicates the extent to which the commercial car enters into the life of a modern corporation. It is impossible to conceive of these operations being carried on so smoothly, efficiently and economically with horse drawn vehicles. Also it should be remembered that in stormy weather, when telephone lines go down, it would be impossible for the horse to do the work. The drifted snow, the sleet and the icy pavements that put the horse out of service or seriously impede his efforts, offer comparatively few and slight obstacles to the power vehicle. So we might say that the excellent service rendered by the telephone company would be impossible to maintain without the commercial car.

C. by International
Film Service

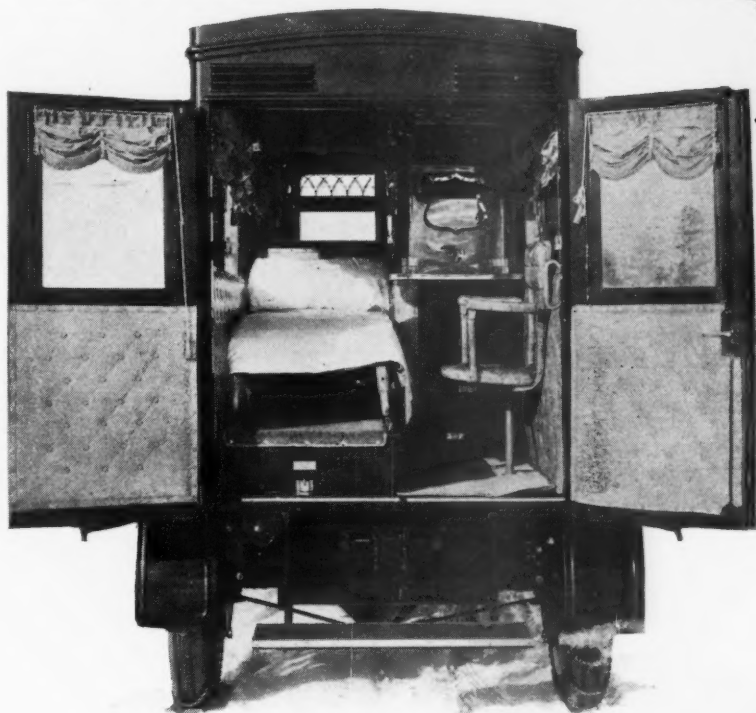


Selden Dental Motor Car

The adjoining illustration shows a French Dental Motor Car mounted on a Selden worm-drive two-ton chassis. It is said that this is the first motor car equipped for dental purposes, and will, without a doubt, be of great benefit to the soldiers "at the front." The Selden Truck Sales Company, of Rochester, N. Y., is building twenty-five of these jobs.

A Cadillac Eight-Cylinder Motor Ambulance (shown below)

This car has running water, a revolving chair, a washstand with French plate-glass mirror, two drinking glasses, electric lights, pongee curtains, genuine leather below all windows, padded to prevent noise. The stretcher is on little wheels which run on a track in the ambulance. This ambulance is in the service of Butterworth & Sons, of Seattle.



New Mack Wrecker for Boston Fire Department

A three and a half ton Mack emergency and wrecking truck just installed by the Boston Fire Department. The truck is equipped with a power winch and 250 ft. of $\frac{1}{2}$ in. cable, a removable derrick, a drawbar for towing, jacks, skids, and all sorts of wrecking apparatus and tools.

The equipment will prove an important acquisition to the Department, on account of its ability to tear down walls in fire ruins, move freight cars in the event of a yard fire, replace derailed cars, pull out trucks stalled in public highways, and remove all sorts of debris.

A Cadillac "Eight" Motor Ambulance in Use by Butterworth & Sons, of Seattle, Wash.

One of the most complete and luxurious private ambulances in America. There are little wheels on the bottom of the stretcher, so that it runs on a track inside of the ambulance.



Activities of the Motor Truck Association of Philadelphia

O. W. DOOLITTLE
President
J. D. HOWLEY
Treasurer

OFFICERS
H. M. COALE
Vice President
W. H. METCALF, Sec'y
328 N. Broad Street



BOARD OF GOVERNORS
LEE J. EASTMAN E. R. WHITNEY D. H. ZIMMERMAN
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COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

NEW OFFICERS ELECTED AT DECEMBER MEETING

ONE hundred members of the Motor Truck Association attended the monthly meeting and dinner at the Hotel Adelphia. The monthly dinners of the auto men are always well attended and interesting, and the last event was no exception.

The three speakers were Judge Eugene C. Bonniwell, judge of the municipal court;

and hearing before a license is granted to any one to drive a motor vehicle of any kind; an anti-glare law; an act making it a misdemeanor for any one without a license to run a car or for any owner to permit an unlicensed person to run his machine, and a legal apportionment of damage resulting from right-angle collisions.

Colonel Penrose gave much interesting data regarding the performance of motor trucks for the American army on the Mex-

ican border, and stated that without their support it would have been impossible to maintain General Pershing's camp far within Mexico. He paid a high tribute to the American made trucks.

Mr. Bartlett advanced some thoughts on the prevention of motor car thefts, among them being a suggestion that garages be required to keep a register, like a hotel guest register, of all cars brought into

their places, the list to be subject to police inspection at all times.

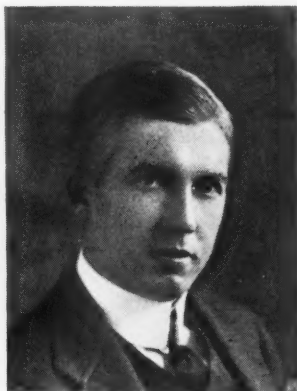
The new officers elected at the dinner are: President, O. W. Doolittle, Foss-Hughes Co.; vice president, H. M. Coale, The Autocar Co.; treasurer, J. D. Howley, The White Co., and secretary, W. H. Metcalf, George W. Houk Co.

Board of governors—Lee J. Eastman, Packard Motor Car Co.; Edward W. Burnshaw, Jr., Girard Automobile Co.; E. R.

NEWLY ELECTED OFFICERS OF THE MOTOR TRUCK ASSOCIATION OF PHILADELPHIA



O. W. DOOLITTLE
President



H. M. COALE
Vice President



JOHN D. HOWLEY
Treasurer



W. H. METCALF
Secretary

Colonel H. Penrose and G. Douglass Bartlett.

Judge Bonniwell's speech was a discussion of the urgent need for revised motor laws in Pennsylvania. He urged that the campaign for an increased membership be pushed with vigor in order that the reforms may have the backing of a strong organization. The judge also proposed the following measures: A test for eyesight

ican border, and stated that without their support it would have been impossible to maintain General Pershing's camp far within Mexico. He paid a high tribute to the American made trucks.

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Whitney, Commercial Truck Co.; W. R. Walton, Firestone Tire & Rubber Co.; D. H. Zimmerman, International Harvester Co.

At the next meeting, on January 17th, the Electric Vehicle Association and the Motor Truck Association will hold a joint meeting. There will be several good speakers and their talks will be illustrated with moving pictures.

NO LET-UP IN STEEL DEMAND

Despite peace proposals the steel market has not shown the slightest sign of disturbance. In many instances a halt was called on further placing of contracts, but these withdrawals only tended to relieve the pressure and has given some of the mills a chance to adjust their books. Leading steel authorities, in discussing the future situation, pointed out that a decline in steel prices would come inevitably, but that the market fundamentals were such that even if peace did materialize early next year, such a development would not unsettle the market, which had reached a stage where it could ignore influences that ordinarily would be disturbing. The shifting of the basis of steel buying from war

trade to purely domestic trade has been the main factor in inculcating strength to the market. Makers of ship plates report a very active demand from domestic shipyards, some shipyards negotiating for plates to be delivered in 1918, in some cases as far ahead as the third quarter of that year.

Quotations on January 11th:

Steel Products Prices

Bessemer billets, per ton, mill.	.60 00	a	....
Open hearth, per ton, mill.	.60 00	a	....
Sheet bars, per ton	.60 00	a	....
Forging billets, per ton, mill.	.80 00	a	....

Iron and Steel at Pittsburgh

Bessemer iron, Valley furnace.	.35 00	a	37 00
Bessemer steel, f.o.b. Pittsburgh	60 00	a	....
Skelp, grooved steel	2 85	a	3 00
Sheared steel skelp	3 00	a	3 10

Skelp, grooved iron	2 70	a	2 80
Sheared iron skelp	3 00	a	3 10
Ferro manganese (80 per cent.), seaboard	165 00	a	....
Steel, melting scrap	24 00	a	....
Steel bars (contracts)	3 10	a	....
Black sheets, 28-gauge	4 50	a	4 75
Galvanized sheets, 28-gauge	6 25	a	6 75
Tank plates, 3/4 and heavier	4 25	a	....

FIRESTONE TIRE & RUBBER Co., Akron, O., has worked out a plan whereby stock will be distributed, from 1 to 3 shares, to each employee according to the term of service. The stock can be purchased at \$100 per share, although the present market value is \$140. Easy payments can be made for 5 years, during which period the stock must remain on deposit with the company.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

**RUSSELL B. MERRILL**

Has become director of purchases and traffic of the Wallace Hood Service Bureau. Mr. Merrill has been connected with the automobile business for the past ten years.

**H. S. GRAVES**

Recently appointed sales engineer of the Russel Motor Axle Company, North Detroit, Mich. Mr. Graves was formerly engineer of the General Motors Company.

**LOUIS SCHWITZER**

Now sales engineer of the Oakes Company, Indianapolis, Ind., with complete charge of production. Mr. Schwitzer was formerly engineer for the Empire Auto Company.

**WM. FISHER JENNINGS**

Has become Eastern sales manager of the Bound Brook Oil-less Bearing Company, Bound Brook, N. J. Mr. Jennings has been connected with the Bound Brook Company.

Personal Items

Guy Gore, advertising manager for the Sparks-Withington Co., Jackson, Mich., is now handling the advertising for the Springfield Body Corp., of Detroit and New York.

H. A. Daniel, 27 Palmer Ave., W., Detroit, Mich., formerly sales manager of the Gearless Differential Co., Detroit, has resigned that position.

Geo. Fritz, formerly in the auto supply business in New York City, has become field secretary and investigator of the National Association of Automobile Accessory Jobbers, and will ultimately make his headquarters in Chicago.

W. Fisher Jennings has become eastern sales manager of the Bound Brook Oil-Less Bearing Co., Bound Brook, N. J., with which concern he has been connected for three years.

Don C. V. Van Dusen, formerly of Knoxville, Tenn., has been appointed Southern district manager of the International Motor Co., with headquarters in New York. He will handle Mack and Saurer trucks in Georgia, Louisiana, Mississippi, Alabama, Florida, North Carolina, South Carolina and Tennessee.

Haze C. Krimmel, manager of the truck tire department of the Philadelphia branch of the B. F. Goodrich Co., has been called to the home office at Akron to do special work.

F. M. Randall, who has been connected with the Los Angeles city sales force of the Hartwell Co., distributor of the Jeffery pleasure and commercial cars for southern California, has become district salesman.

E. G. Scott, formerly with Kissel Motor Car Co. and Packard Motor Car Co., has joined the Kentucky Wagon Mfg. Co., and will demonstrate the Old Hickory Truck to the Ohio trade.

Barney Shea, formerly adjuster for the Sells-Floto Circus, is now connected with the Denmo St. Louis Sales Co., selling the Denmo truck.

J. Frank Shugers, who has been connected with the Auburn Automobile Co., Auburn, Ind., since its inception, and for the past twelve years superintendent of the company, has tendered his resignation. He has not yet announced his plans for the future.

G. E. Smith has become sales manager of the Blair Motor Truck Co., Newark, O., succeeding F. L. Swanberg.

S. B. Taylor, sales manager of the S K F Ball Bearing Co., of Hartford, Conn., has been appointed vice-president of the company, succeeding F. B. Kirkbride, who remains on the board of the company. Mr. Taylor will remain in charge of sales.

G. A. Ungar, former representative of the S. K. F. Ball Bearing Co. in Cleveland, Detroit and Pittsburgh, has been appointed technical manager and chief engineer, succeeding Uno Forsberg, who returns to Sweden after completing his work of creating the manufacturing organization of the S K F Ball Bearing Co. in this country.

Rollin W. Hutchinson, Jr., for the past three years general sales and advertising manager of the Sterling Motor Truck Co., Milwaukee, Wis., and its predecessors, the Sternberg Mfg. Co. and the Sternberg Motor Truck Co., has resigned to devote himself to several manufacturing enterprises in which he has been interested for some time, making efficiency increasing auxiliaries for motor trucks.

L. C. Long, well known in the motor world, has joined the Federal Motor Truck Co., of Chicago, local distributors of the Federal truck. He will fill the office of vice-president and with Grant Nichol will have charge of the Chicago selling force.

**C. R. NORTON**

Manager of the truck sales department of the Packard Motor Car Company, has been promoted to the position of general sales manager.

**LAURENCE J. EARLE AND GEO. H. BOGGS**

Of the firm of Earle & Boggs, Inc., 1790 Broadway, New York City, manufacturers' representatives, who carry a general line of automobile accessories, have been appointed Eastern representatives of the Buda Company, manufacturer of engines for automobiles, motor trucks and tractors.

**J. O. EATON**

Formerly the treasurer of the Torbensen Axle Company, has recently taken the duties of general manager of the company.



J. A. CLARK

For ten years sales manager of the New York branch of the Peerless, has accepted a similar position with the Van Cortlandt Vehicle Corp., of New York, distributors of Peerless trucks.



T. P. MYERS

Formerly manager of the truck department of the Packard Motor Car Company, in New York City, has become general sales manager of the General Engineering Company.



L. R. O'CONNOR

Now manager of purchases of the Acason Motor Truck Company. Formerly with the Trio Manufacturing, Standard Motor Truck, and the Continental Motor Companies.



L. G. FAIRBANKS

Has just been made Eastern district manager for the Firestone Tire & Rubber Company, of Akron, Ohio. He has been assistant advertising manager for the past three years.

New Incorporations

Federal Automobile & Supply Co. has been incorporated in Camden, N. J., with a capital of \$100,000, to manufacture motor vehicles and equipment. The incorporators are C. M. Reeves, Wm. A. Walton and Thomas Roberts.

Commercial Vehicle Motor Co. has incorporated in Chicago with \$100,000; Henry D. Cheney, Pete L. Evans and Mabel Durand, incorporators.

Bestever Truck Co. has been incorporated in Chicago, Ill., with a capital of \$100,000, by H. H. Ready, L. C. Coyner and Mrs. Nina Ready.

Landover Auto Truck Co., Dover, Del., has incorporated with a capital of \$300,000, to deal in attachments for converting pleasure cars into trucks.

Ypsilanti Motor Truck Co. has been incorporated in Ypsilanti, Mich., for \$50,000, to manufacture auto trucks and parts, by Gilbert Porter, Ralph Ashton and H. R. Scovill.

Ultra Truck Corp. has incorporated in Philadelphia, Pa., with a capital stock of \$200,000.

Union Truck & Equipment Co. organized in New York City with \$800,000, to manufacture motor vehicles and parts.

New Truck Agencies

Garford Motor Truck Co. has leased the 2-story and basement building at 1708-1710 Main St., Kansas City, Mo., and will remodel it for use as distributing center for its trucks in the West.

Bert Lee, Bangor, Mich., has taken the agency for the Ford-Dearborn 1-ton truck.

H. E. McEldowney, of Seattle, Wash., has been appointed agent for the Hendrick's 1-ton truck attachment.

E. R. Klemm is erecting a 2-story service station for motor trucks, 32 x 132 ft., 1439 W. Austin Ave., Chicago, Ill.

Removals and Trade Changes

Guaranty Securities Corp. has moved its San Francisco office to 1336 Van Ness Ave.

Hartwell Motor Co., distributor of the Jeffery pleasure and commercial cars, has moved to 1224-26 S. Flower St., Los Angeles, Cal.

Kells Mfg. Co., 521 W. 45th St., New York City, has been taken over by the Consolidated Auto Radiator Mfg. Co., Inc. The executive offices are located at 47 W. 34th St. The same management will obtain as formerly.

Robbins & Myers Co. has moved its Rochester office at 740 Ellicott Square Bldg., Buffalo, N. Y. L. Larsen, manager of the Rochester office, will have charge of the Buffalo firm.

Smith Motor Truck Corp., Chicago, Ill., has been incorporated in Virginia to take over the business of the Smith Form-a-Truck Co., the capital stock being \$11,400.

Factory News

Champion Motors Co., Inc., of Fulton, Ill., manufacturer of the Champion light delivery truck De Lux, has opened offices at 801-04 Hippodrome Bldg., Cleveland, O. It is the intention of the company to establish at Cleveland a large assembling plant in the near future, to which the trucks will be shipped from the factory in a knocked-down state for assembly for the eastern market.

Commercial Truck Mobile Co., Chicago, increase of stock from \$2500 to \$50,000.

Gary Motor Truck Co. has increased its capital stock from \$25,000 to \$50,000.

Moreland Motor Truck Co., Los Angeles, Cal., now occupying a plant on N. Main St., will erect a large factory to cost \$1,500,000.

Palmer-Moore Co., Syracuse, N. Y., has increased its capital to \$300,000 and will enlarge its plant in order to double the output of trucks next year.



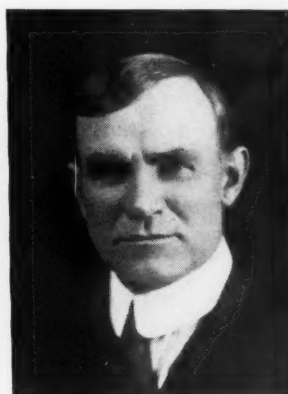
EDWIN A. TRAVIS

Formerly assistant sales manager has been promoted to the position of general sales manager of the Locomobile Company of America.



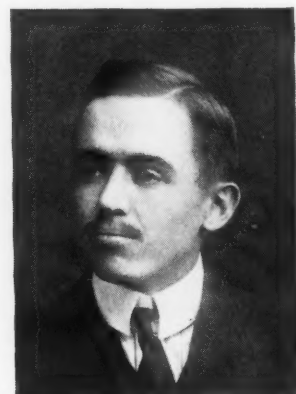
PERCY W. HINE

Formerly associated with the sales department at the executive offices of the Locomobile Company, has become manager of the Bridgeport territory.



WILLIAM MARTISON

Formerly superintendent of the Nash Motors Company, has become vice president and factory manager of the Winther Motor Truck Company.



DELMAR G. ROOS

Has become assistant chief engineer of the Locomobile Company. Mr. Roos has been connected with the engineering department for several years.

THE COMMERCIAL CAR JOURNAL

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GAS TRACTOR RATING

ON another page will be found an abstract of a paper before the American Society of Agricultural Engineers on the Standardization of Gas Tractor Ratings.

We concur with the author, Raymond Olney, that there is great need for a standard rating and agree with his argument for expressing it both in drawbar horsepower and belt horsepower, because these mean most to the user.

Who establishes the standard is of least concern. It may be entirely in order for the National Association of Tractor and Thresher Manufacturers to take the lead, but our suggestion would be that the S. A. E. in its broader scope as the Society of Automotive Engineers is the logical and most impartial organization and should be the one to establish the standard. At least it should co-operate in the work. Perhaps the more organizations there are united in the effort, the greater will be the assurance that an acceptable standard will be agreed upon and hence the greater probability of its more universal and prompt adoption.

May the good work proceed with all celerity.

Merit wins—that's why—advertise in the CCJ

SPECIAL BODIES FOR TRUCKS

IT has been pleasant to hear on every hand the appreciation of our caricature of special bodies on page 35 of the December issue. Seriously speaking, however, there is more than the humorous element to be considered in this special body question. The cartoon was inserted in an article that showed also reproductions from photographs of actual bodies that have been built and used with great advantage from an advertising standpoint at least by the owners.

Aside from the fantastic body there is also the opportunity of increasing the utility of the commercial car body. If we will only get away from the cut-and-dried lines handed down by the horse and wagon, there are innumerable ways in which bodies of greater convenience can be developed for light delivery wagons, even as they have been so largely developed for heavy trucks.

With the transition from horse-drawn deliveries to commercial cars there is every reason why more thought should be given to bodies designed not only to attract attention but to increase the convenience of their use. The day has passed when the same form of wagon should be used for handling all kinds of merchandise. The baker, the grocer, the department store and all other trades can more readily than ever before have their specific needs appropriately and consistently considered.

The value of individuality in the delivery cars of different merchants goes without saying. It does not necessarily mean that the car must be a freak, although obviously, the more striking the design, the greater will be the impression that it will make. It is interesting to notice in the article accompanying the cartoon in the December issue that the merchants who were interviewed on the subject of whether or not they would be interested in special bodies were enthusiastic, with but few exceptions, and probably even these would welcome a body that was distinctive, even if not favoring the flashy type.

It is very evident, therefore, that a big field exists for builders of special bodies, particularly if they can undertake to do the work on such a scale as to turn them out for a moderate price. Few of us but remember the old gabled sign wagons dragged through the streets for no other purpose than advertising. If there was profit in such a practice, certain it is that with a wagon or car performing the useful purpose of delivering goods at the same time, whatever this advertising amounted to it would at least cost nothing beyond the interest on the investment in the body.

One of the greatest hindrances to the more extended use of special bodies has been their cost. Built to order by the local carriage and wagon works, as horse-drawn vehicles have been for years, they naturally may cost four or five times as much as a standard design. The local men cannot dispose of more than one body of each special pattern because the greatest advantage of most special bodies is lost if they are duplicated in any given city. Reduction of cost by quantity production is therefore out of the question for local body builders, but those doing a national business can make a number of each design of body even though they still sell only one in a locality. These builders have a big opportunity open to them in the supplying of special bodies for different trades.

THE TRACTOR AND TRAILER FIELD OFFERS GREAT OPPORTUNITY TO DEALERS

AMONG all the branches of automotive engineering the least developed and one of the most attractive fields for its possibilities is that for tractors and trailers, particularly in the West. That this truth is realized is becoming ever more evident. In other parts of this issue will be found two articles bearing this out, one an address to dealers by the manager of a bearing manufacturer, page 49, and the other an account of the popularity of tractors and trailers in the West, page 45. The latter emphasizes that trailers are proving their value in the lumbering industry of

the Northwest and have made it possible to move huge logs at a cost far less than the narrow-gauge railroads.

Tractors are also revolutionizing the agricultural methods of the Northwest and making it possible for huge tracts of land to be put under the plow at a very slight added cost. The tractor and trailer have come to stay for three reasons: First, they are efficient; second, they are economical, and, third, they are saving the lives of horses which died in large numbers because of the huge loads that they were forced to pull formerly. They are a factor in civilization that alert and progressive dealers should not overlook and it behooves them to immediately secure agencies and take advantage of a virgin field while the business is in its infancy.

Change of S. A. E. Name

A to Stand for Automotive Instead of Automobile. To Include Aeronautic, Tractor and Motor Boat Fields

THE close association of the work of the automobile engineers with that of the aeronautic and the tractor engineers, as well as with that of engineers engaged in the design and construction of internal combustion engines for motor, ship and stationary power units, is becoming well recognized. The community of interests in these diversified fields has already led to a most desirable working arrangement between the S. A. E. and organizations representing the respective fields. The consolidation of the engineering membership of these societies is already well advanced. At the meeting of the S. A. E., held in New York, January 11, a constitutional amendment was considered providing for a change in name from the Society of Automobile Engineers to the Society of Automotive Engineers and for representation of the newly-allied fields of engineering activity on the Council of the Society. The American Aeronautical Engineers and the Society of Tractor Engineers have voted in favor of the proposed consolidation and the executive committee of the National Association of Engine and Boat Manufacturers has recommended that the engineers associated with its company members, apply for membership in the S. A. E. and co-operate fully in what standardization shall be feasible in the motor boat and motor ship design and production. Similar action will probably be taken by the National Gas Engine Association and the American Society of Agricultural Engineers as to farm tractor and stationary engine standardization. Among the members of all the organizations there is a realization of the great benefit that will result from united effort.

The Federal Government, as a result of the widespread demand for national preparedness, has come to recognize in the S. A. E. an organization whose co-operation is of the utmost importance to both the Army and Navy Departments. The lack before the war of similar co-operation between some of the European govern-

ments and engineering organizations in their countries similar to the S. A. E. led to much needless delay and inconvenience following declaration of war. This condition of affairs will be largely avoided in this country as a result of the working relations between the Federal Government and the S. A. E. and other engineering organizations. During the year just closing the Society has entered into active co-operation with the government and rendered service of great value in many directions. This action is believed to be without precedent. The Truck Standards Division is working closely with engineers of the government in the development of standard specifications having to do with a truck suitable for motor transport purposes. Another committee is in quite as close touch with engineers of the War and Navy Departments in the matter of standardization of airplane accessories and engine parts. This has emphasized, as might have been expected, the fundamental interrelation of the fields of motor car, aeronautic, tractor and motor ship engineering and indicated clearly the desirability of closer association of men engaged in these fields.

The annual meeting of the Society, held January 11, in New York, at the time of the Automobile Show, reflected in its program the newer activities of the organization as shown by the titles of the papers read. These were:

Some Problems in Airplane Construction—Capt. Virginius E. Clark, U. S. A., Capt. T. F. Dodd, O. E. Strahlmann.

The Ultimate Type of Tractor Engine—H. L. Horning.

Dynamic Balance of Rotating Parts and Dynamic Balancing Machines—F. Hymans.

Problems in Dynamics of the Automobile—N. W. Akimoff.

Some Essential Features of High-Speed Engines—A. F. Milbrath.

Heat-Balance Tests of Automobile Engines—Prof. Water T. Fishleigh and Walter E. Hay.

Aerial Navigation Over Water.—Elmer A. Sperry.

The Society will also hold during the First Pan-American Aeronautical Exposition to be held at the Grand Central Palace, February 8-15, a technical session at which will be presented discussions by leading designers on the present developments and possibilities of airplane engines.

The Standards Committee of the Society is now being reorganized to provide for carrying on additional standardization work in the aeronautic field, and inaugurating the same work in motor ship and in tractor engineering.

The number of the Sections of the Society, which hold monthly meetings at the important industrial centers throughout the country, has now been increased to seven by the establishment of the Buffalo Section, which will devote a large amount of attention to motor boat and aviation problems, particularly the latter, as well as to motor car engineering. A further development of the broadened scope of work will be the establishment at an early date of a Farm Tractor Section, with headquarters at Minneapolis.

CELFOR TOOL AND BUCHANAN ELECTRIC STEEL COMBINED

The business of the Celfor Tool Co. and the Buchanan Electric Steel Co. have been taken over by a new company under the name of the Clark Mfg. Co., with a capital stock of \$5,000,000 (\$2,000,000 preferred and \$3,000,000 common.) The merger is solely for the purpose of strengthening both companies and will enable them to serve their customers even better than ever. There will be no change in the manufacturing or selling methods of either company, and the personnel of the organization will be the same.



American Boys at Verdun

The picturesque gates of the old fortress of Verdun. In the foreground is one of the cars of the American Ambulance, and American boys who are serving France at the risk of their lives.



An Armored Motor Car Belonging to the Carranza Forces in Juarez



With the British Armored Car Section Through Russia to the Caucasus

Scene in the mountainous roads of the Caucasus, showing part of the British armored car section halting while another part gets past a difficult pass in the road.



Below is shown a squadron of British armored cars en route for the Caucasus front



With the British Armored Car Section Through Russia to the Caucasus

Light British lorries of the armored car section crossing Russian stream in the Caucasus, en route for the front



German Howitzer Train

On the right is a scene during the early part of the German invasion of Roumania, the illustration showing a huge howitzer train driving into Roumania.



CONTINENTAL MOTORS CO. TO AID CAR MAKERS AND DEALERS BY ESTABLISHING SERVICE STATIONS IN LARGE CITIES

Continental Motors Co., of Detroit and Muskegon, Mich., has closed contracts in New York and San Francisco for the first of the service stations to be opened. It is the plan of the company to establish completely equipped service stations in all principal cities of the country, not only for serving the owner of a vehicle equipped with a Continental engine, but also to render to the manufacturer and dealer invaluable assistance in solving their respective service problems and effectively aiding in their sales. The company will enable the dealer to operate his service station at a lower cost by delivering parts to him promptly, thus enabling him to save hours and days of delay. This will also be beneficial to the manufacturer because he can obtain dealers who appreciate the value of service.

WICHITA FALLS MOTOR COMPANY HELD GET-TOGETHER MEETING

On December 11th the Wichita Falls Motor Co. held a get-together meeting at the Westland Hotel at which the principal speakers were General Manager J. G. Culbertson, Assistant General Manager C. Y. Tully and Hugh G. Cargo. As a result of this meeting it was decided to hold regular assemblies for the purpose of discussing manufacturing production and such other subjects as will be beneficial.



New Giant Truck Tire

This is claimed to be the largest single-tread solid tire ever built, being 42 x 14 in. It has been constructed to meet the commercial demand for a tire that would give adequate service on six and eight-ton trucks. This tire is now being produced by the Firestone Tire and Rubber Company, of Akron, Ohio. At the left of the illustration is C. E. Speaks, manager of truck tire sales, and at the right is L. C. Clough, of truck-tire department.

THE UNUSUAL ECONOMIES OF A HEAVY-DUTY MOTOR TRUCK

By R. W. HUTCHINSON, JR.

The Hales & Edwards Co., Chicago, is the largest manufacturer of poultry and live stock feeds in the Central West. The transportation problem of this company is essentially the haulage of the prepared feeds from two large mixing plants in Chicago to jobbers in greater Chicago, and to the terminals of rail and steamship companies, i. e., short and medium length heavy duty hauls. As the several brands of feeds are sold to the consumer in 100 lb. sacks, the body equipment of the seven-ton Sterling trucks is a large covered grocery type body with open or stake type side doors to permit of easy loading and unloading from both side and rear. At the feed mixing elevators where the product is sacked, conveyor chutes or slides deliver the sealed sacks at the tail gate so that two helpers standing in the body can quickly pile them.

The performance data of tonnage hauled by one of the 7-ton trucks is given in the following tables:

RECORD OF STERLING TRUCK JAN. 1 TO AUG. 1, 1916.

	Mileage	Tonnage	Gals. Gasoline	Gals. Oil	Wages	Hrs. Run	Earnings
January	996	1,198,589	250	14½	\$151.67	175¼	\$441.69
February	787	1,097,080	257	13	145.83	176¼	406.88
March	988	1,250,831	289	16¾	156.50	204¼	461.18
April	870	1,214,539	253	18½	145.83	179¾	455.34
May	955	1,195,174	265	17½	157.50	198¾	438.10
June	931	1,228,796	249	16¾	151.67	197¼	460.93
July	941	1,086,062	244	15½	151.67	181½	406.26
Totals	6248	8,269,071	1807	112½	\$1061.67	1312½	\$3070.37

EXPENSE

1807 gals. Gasoline at .18½	\$334.30
112½ gals. Oil at .32	36.00
Wages	1061.67
Tires	447.84
General Repairs	75.00
	\$1954.81
Net Earnings	\$1115.56

The Hales & Edwards Co. pays considerably above the average wage for truck drivers, and in consequence has an unusually low upkeep cost for handling this relatively large tonnage. When a truck user can handle nearly 4200 tons in a 7-ton truck for a maintenance cost of only \$75, the investment return on an efficient driver's wages is a big factor.

As the Hales & Edwards Co., prior to the installation of the first of these 7-ton trucks, was not a user of motor trucks and necessarily had to adjust its methods and systems to the increased efficiency of motor transportation, the tonnage handled in the seven months period is considerably below that now handled and the average monthly operating expenses is also declining. Nevertheless, the result is unusual in that the figures show a cost of only 21.9 cents per ton, or 0.074 cent per ton mile for motor truck delivery as against the estimated cost of 38 cents per ton and 12 cents per ton mile with horse drawn trucks. The company did not previously keep accurate haulage cost records, so another lesson the motor truck has taught is the value of keeping real, accurate cost data.

Although the data shows truck earnings of \$1115.56, this only partially represents the economy gained. Each 7-ton truck has replaced four 3-hitch trucks and although accurate figures, as stated, on the horse

drawn haulage are not available, the company estimates that in an equivalent seven months period, each motor truck has handled in addition 33 1-3 per cent. more tonnage and that the total upkeep cost per 7-ton truck in comparison with the equivalent number of teams replaced is approximately 40 per cent.

Considering that the efficiency of these trucks is considerably reduced by their being used almost entirely in the heavy traffic zones of Chicago, where congestion and frequent waiting at terminals is common, their achievement is extraordinary.

MIFFLINBURG BUGGY COMPANY'S BODY FOR THE FORD CHASSIS

In our last issue on page 23 we printed a description of the Mifflinburg Buggy Co.'s body for the Ford chassis. This company has changed the size of its bodies since then from 56 in. long rear of seat to 60 in., and from 40 in. wide inside to 43 in.

INTERNATIONAL MOTOR CLOSES GOOD YEAR

The International Motor Co., New York City, reports that it has closed the year 1916 with a large expansion of sales, domestic business alone having increased 132 per cent. over 1915. It has been the best year in the company's history. December was a month of individual branch records and also shows an increase over last December's sales of 90 per cent. Sales from all quarters show a healthy development and growth of unusual proportions.

The rapidly expanding use of heavy-duty trucks is becoming one of the big developments of the truck industry. A short time ago it was believed that only a few lines of business could profitably employ trucks as big as 7½ tons, but heavy-duty transportation has received such a remarkable impetus during the past year, owing to the increased tonnage to be handled, that from necessity, coupled with the economy in moving large capacity loads at one haul, the big motor truck is becoming more popular every day. Its advantages are obvious. Moving a 7½ ton load at a slower speed perhaps, but hauling twice the tonnage of a faster 6000 lb. truck, not only saves labor cost, but reduces ton-mile cost, and gives greater economy in operation.

THE GENERAL MOTORS TRUCK Co., Pontiac, Mich., announces that it will double its production during this year. This will necessitate the installation of the track system as used in the Ford plant, at Detroit.

For its readers—information; for its advertisers—results. That's the purpose of the CCJ

TRAFFIC CONDITIONS DISCUSSED AT M. T. C. OF A. MEETING

By C. P. SHATTUCK

AT the annual meeting of the Motor Truck Club of America, held December 20, at the Automobile Club of America, New York City, it developed that the policy of the organization, insofar as its members is concerned, has greatly changed. It is now largely made up of users of commercial cars, and trade representatives are not eligible. Practically every industry is represented, including many well-known fleet owners. The report of the secretary, Ellis L. Howland, showed that the organization has a substantial balance on the right side of the ledger.

The club has been active during the past year, has held ten meetings and has taken an active part in combatting legislation adverse to the motor truck, particularly the New Jersey and New York bills. The members turned out in large numbers at the hearings given the New Jersey bill, and the club was well represented by counsel. Among the subjects in which the club has taken an active part is the regulation of drivers, highways and a plan for mobilizing commercial cars in the event of war.

That the club is influential and its efforts are appreciated was manifest by the opening remarks of Police Commissioner Arthur D. Woods, who addressed the members on the subject of traffic regulations from the standpoint of general safety. He said that the police department appreciated the co-operation of the club and assured the members that the club would be consulted before any attempt be made to pass bills governing the use of trucks in New York, and asked that a committee of three practical men be appointed to co-operate with the police department in devising ways and means of improving present traffic conditions.

Mr. Woods, who is an interesting speaker, prefaced his address by reading the records of the number of persons killed in New York, in November, by motor trucks and analyzed the causes. These included fatalities due to carelessness on the part of pedestrians, unavoidable accidents and those caused by negligence of the drivers and through inefficient brakes. It is interesting to note that in only two cases did it appear that speed was the cause, and that the majority of persons injured were children and old people.

In speaking of traffic Mr. Woods said that traffic must be expedited, not slowed up, for New York is suffering from a plethora of traffic in its streets. "The crux of the situation is," said Mr. Woods, "to move traffic as fast as safety permits. There are four general rules that users of motor trucks should observe. The first is to exercise every possible care in the selection of the drivers, capable drivers. What we want is a reasonable bill, dealing with the qualifications of the driver of a motor truck.

"The second rule is, look after the mechanical condition of your truck. A fatal accident resulted recently, because a tire worn to the channel caused the truck to

skid in the car track. The driver lost control and the truck struck and killed two children. Keep your trucks in good operating mechanical condition. The police department desires the privilege of inspecting the brakes of all trucks, but at present it is only done by consent of the owner.

"The third suggestion is, do not rely too much on the horn. The theory of some drivers that the horn clears the way for his vehicle is wrong. In many instances it has been demonstrated that it would have been better if no horn at all was used. The indiscriminate use of the horn often bewilders people, particularly old persons. The fourth rule is, keep on training your drivers. Some are not fitted by temperament for driving big trucks, others have bad habits. What we want is a big margin of safety on both sides, the driver and the pedestrian. Some of the latter do not believe the truck has a right to the street. The needs of traffic summarized are move your trucks as fast as you can with safety, employ careful drivers, keep your trucks mechanically perfect and do not rely too much on the horn."

J. T. Fetherstone described the system and methods utilized by the city in removing snow with reference to traffic conditions. He quoted some very interesting figures as equipment utilized and persons employed, as well as gave concrete examples of the difficulties experienced. He stated that his department removes snow from an area equal to 915 miles of a highway 60 feet wide, or a distance equal to that between New York and Chicago. Reference was made to the use of a plow that is attached to a motor truck and explained how the blade of the plow was arranged so that in the event an obstruction was encountered the front axle of the truck would not be injured. These plows push the snow to one side.

Mr. Fetherstone called attention to the possibility of a heavy snow fall so blocking the streets that the food and fuel supply would be endangered, and explained at some length the desirability of owners of motor trucks co-operating in the removal of the snow. He pointed out that he desired a volunteer corps, but stated that the city would pay for the service, provided the requirements of the department as to capacity, registration, etc., were conformed with. It is proposed to use the volunteer trucks at night, and these are to be supplied with plows by the city. Mr. Fetherstone pointed out the advantage accruing the truck owner in co-operating with his department, stating that with the streets blocked traffic would be dead, resulting in a loss to the owners of commercial cars. A concern operating a large fleet of trucks in Brooklyn, has offered the services of four trucks for 10 hours daily, provided the city would supply the ploughs. In response to Mr. Fetherstone's appeal a committee of three is to be appointed by the club to work out a plan whereby its members will act as a volunteer corps, to be called upon as a reserve unit.

Previous to the annual election of officers the members sat down to dinner, after which a ballot taken resulted in the following officials for the ensuing year. President,

Roderick Stephens; first vice-president, Haywood P. Cavalry; second vice-president, George H. Pride; third vice-president, David C. Fenner; secretary, Ellis L. Howland; treasurer, Nat Mallough. The directors for three years are Charles W. Blackman, Henry K. Jaburg, Theodore D. Pratt and G. A. Green. L. E. Campbell was elected director for two years to fill the unexpired term of George H. Pride.

Following the addresses general business was transacted and a discussion followed of the proposed bill fixing the registration fees for trucks and omnibuses in New York.

The Proposed Schedule

The revised rates go into effect February 1, but owners of commercial cars and the trade find consolation in the statement reported to have been made by Governor Whitman that the delegating of the power to fix taxes to a commission is unconstitutional.

The findings of the committee, given herewith, are along the lines of the New Jersey bill insofar as taxation is considered. In some instances the New York rates are five or more times the present or rather past rate of \$5 flat.

Motor vehicles used as omnibuses for transporting passengers are to be taxed according to their seating capacity, and as follows: Five passengers or less, an annual fee of \$15; 6 to 7 inclusive, \$24.50; 8 to 10 inclusive, \$30.50; 11 to 16 inclusive, \$43; 17 to 20 inclusive, \$52; 21 to 22 inclusive, \$55; 23 to 26 inclusive, \$61.50; 27 to 30 inclusive, \$67.50. For each passenger in excess of 30 a fee of \$2 for each passenger is to be imposed. If any motor vehicle used for transporting passengers, and for which a fee is herein provided, is originally registered after August 1 in any year, the fee for that year shall be one-half.

The combined weight of the truck and its carrying capacity has been used as a basis by the commission in determining the rate of tax. The fees referred to are annual. Two tons or less, \$10; more than 2 and not more than 3, \$15; more than 3 and not more than 4, \$20; more than 4 and not more than 5, \$25; more than 5 and not more than 6, \$30; more than 6 and not more than 7, \$35; more than 7 and not more than 8, \$40; more than 8 and not more than 9, \$45; more than 9 and not more than 10, \$50; more than 10 and not more than 11, \$55; more than 11 and not more than 12, \$60; more than 12 and not more than 13, \$65; more than 13 and not more than 14, \$70. Vehicles in excess of 14 tons are to be charged \$10 for each additional ton.

It is understood that, owing to the statement credited Governor Whitman, the entire schedule will be submitted to the legislature for authorization, and this will afford an opportunity for the commercial car interests to combat the bill. At the meeting held December 21 it was urged by the counsel of the club that the commission file in its report the contentions of the club that the tax was unconstitutional. This point appears to have been considered by the chief executive of the State.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

Buyers' Information Commercial Car Review

(Eastern Section)

On the following pages is given a complete review of the Commercial Car Models which will be manufactured for the coming season by Eastern American Manufacturers.

See Complete Indexes on Pages 38, 39 and 40

THIS is the first or Eastern Section of the Review, and includes cars manufactured in the following States: Connecticut, Delaware, District of Columbia, Georgia, Kentucky, Maryland, Massachusetts, New York, New Hampshire, New Jersey, North Carolina, Ohio and Pennsylvania.

The second or Western Section will be issued February 15th, and will contain a review of cars made in the following States: California, Illinois, Indiana, Iowa, Louisiana, Michigan, Minnesota, Missouri, Nebraska, Oregon, Texas, Washington and Wisconsin.

The data given in this Review was supplied direct by the makers, and is as correct as can be obtained up to the date of publication.

Key to Abbreviations will be found on the leaf attached to this page; when this is opened out it will be found very convenient to refer to, no matter which pages of the Review are consulted. Indexes will be found on pages 38, 39 and 40.

Criticisms and Suggestions on this Buyers' Information Review are invited. We want to know whether it meets requirements and how it can be made better, if possible.

Horse Power.---All horse powers are calculated by the S. A. E. formula: $H. P. = \frac{D^2 N}{2.5}$, where D = bore in inches and N = number of cylinders.

On the other side of this leaf will be found the key to the abbreviations used in the

***Buyers' Information
Commercial
Car Review***

While consulting the Review, turn this leaf out so that it extends beyond the book, it will then be convenient for reference, no matter how many pages you turn to.

Indexes arranged alphabetically and according to price are on pages 38, 39 and 40.

KEY OF ABBREVIATIONS

USED IN THE

Annual Commercial Car Review

Capacity: In pounds. 2000 lbs. = 1 ton.

Chassis Weight: In pounds.

Price: In tables, the prices are for chassis only, unless marked with an asterisk (*), in which case this shows complete car price.

In captions, prices are for car complete as shown in illustration, unless marked with (X), in which case it indicates chassis price.

Engine: O, own make; A, Falls; B, Buda; C, Continental; D, Hercules; E, Light Mfg. & Foundry Co.; F, Ferro; G, Golden, Belknap & Swartz; H, Herschell-Spillman; I, Massnick-Phipps; K, Knight; L, LeRoi; M, Emerson Engineering Co.; N, Northway; P, Pruch; Q, Teetor; R, Rutenber; S, Wisconsin; T, Sterling; U, Waukesha; V, Beaver; W, Wiedley; X, Somner; Y, Lycoming; Z, North American Motors Co.

Horse Power: Calculated by S. A. E. formula, $H. P. = \frac{D^2 N}{2.5}$; D = bore in inches, N = number of cylinders.

Motors are 4 cylinders unless H. P. is preceded by an asterisk (*), which indicates 2-cycle.

Cylinders Cast: S, single; P, pairs; B, en bloc.

How Cooled: A, air; C, centrifugal pump; G, gear pump; T, thermo-syphon; W, water.

Radiator: C, cellular; H, honeycomb; T, tubular; V, vertical.

Carburetor: A, AWT; AU, automatic; BL, ball; C, Carter; E, Ensign; EX, Excelsior; F, Flechter; G, Gem; H, Holley; HA, Hartmen; HN, H. & N.; J, Johnson; K, Kingston; KD, K. D.; LG, Longuemare; M, Marvel; MS, Master; MY, Mayer; N, Newcomb; O, own make; P, optional; R, Rayfield; RB, Richenbach; S, Stewart; SB, Stromberg; SH, Shakespeare; SL, Schebler; SP, special; T, Tillotson; Z, Zenith.

Ignition, Type: B, battery; D, distributor; M, magneto.

Ignition, Make: A, Atwater Kent; AL, Auto-Lite; AM, American Battery; B, Bosch; BL, Berling; BR, Briggs; C, Connecticut; D, Delco; DX, Dixie; E, Eisemann; G, Gray & Davis; H, Heinze; K, Kingston; M, Mea; MY, Mayer; N, National; P, optional; R, Remy; S, Simms; SD, Splitdorf; U, U. & H.; WS, Westinghouse.

Spark-Plug Size: S, S. A. E.; $\frac{1}{2}$, $\frac{1}{2}$ -inch pipe; M, Metrie. Spark-Plug Sizes, S. A. E., $\frac{7}{8}$ -inch diameter, 18 threads straight. $\frac{1}{2}$ -in pipe, size, $\frac{1}{8}$ -in. diameter, 14 threads, tapered.

Lubrication: F, force feed; G, gravity; S, splash feed.

Clutch: B, band; C, cone; D, disc; I, individual clutch; U, unit control.

Drive: B, bevel gear; C, chain; CT, concentric spur; F, friction; I, internal gear; O, own; R, roller; S, shaft; SP, spur; W, worm.

Transmission: O, own make; A, Cotta; B, Brown-Lipe; C, Covert; D, Detroit; E, Mechanics Machine Co.; F, Fuller; G, Grant-Lees; I, individual clutch; L, planetary; M, magnetic; N, Northway; P, progressive; Q, friction; R, Rockford; S, selective; T, Motor Machines; U, Muncie; V, Lefever Arms; W, Warner; Z, Entz.

Rear Axle: O, own make; A, American Ball Bearing Co.; B, Torbensen; C, Columbia; CL, Cleveland; D, Detroit; E, Weston-Mott; F, floating; G, American Gear & Mfg. Co.; H, Hess; I, Empire; J, Gemco; L, Salisbury; M, Mott; N, Sheldon; P, Peru; Q, dead; R, Celfor; S, semi-floating; T, Timken; U, Russel; W, Walker-Weiss; $\frac{3}{4}$, $\frac{3}{4}$ -floating; $\frac{7}{8}$, $\frac{7}{8}$ -floating.

Tires: Tires are solid unless otherwise stated—*, pneumatic; C, cushion; D, dual; T, triple; S, steel.

Driver's Seat: R, right; L, left; O, optional.

Brake and Gear-Lever Location: C, center; R, right.

Engine Starter: A, Apple; AC, Allis-Chalmers; AL, Auto-Lite; AR, air; B, Bosch; BJ, Bijur; D, Delco; DS, Disco; DT, Detroit; DY, Dyneto; E, Electric; GD, Gray & Davis; H, Heinze; LN, Leece-Neville; NE, Northeast, O, own make; P, optional; R, Remy; SD, Splitdorf; SH, Simms-Huff; U, U. S. L.; WG, Wagner; WL, Ward-Leonard; WS, Westinghouse; X, extra; Z, Entz; 1, single unit; 2, double unit.

ADDITIONAL ABBREVIATIONS USED ON ELECTRICS

Battery: E, Exide; ED, Edison; G, Gould; O, own make; OP, optional; P, Philadelphia.

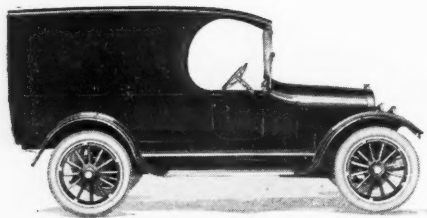
Motor: WS, Westinghouse; O, own; WG, Wagner; GE, General Electric.

Controller: CH, Cutler-Hammer; GE, General Electric; O, own; WG, Wagner; B, barrel; WS, Westinghouse.

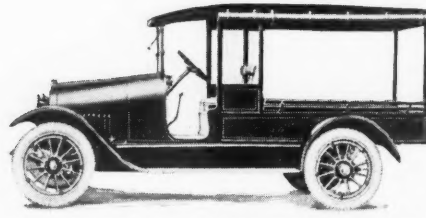
Steering Gear: V, lever; O, own.

Indexes arranged alphabetically and according to price, are on pages 38, 39 and 40

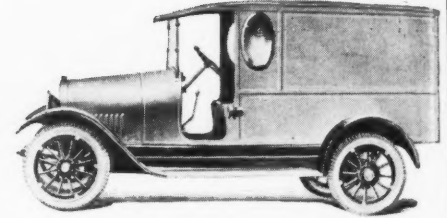
FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE



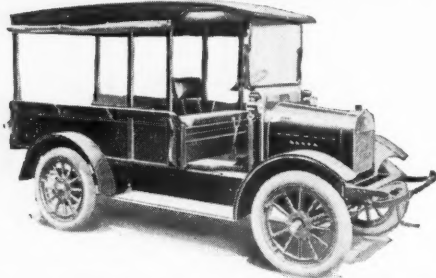
Overland Model 75-B, 750-lb. Panel, \$625.
Made by Willys-Overland Co.



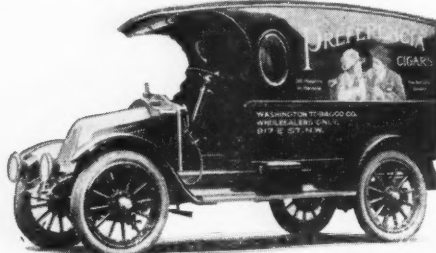
Pullman 1000-lb. Covered Flareboard, \$750.
Also Full Panel, \$775.



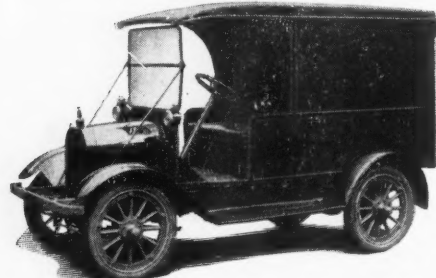
Pullman 1000-lb. Full Panel, \$775.
Also Covered Flareboard, \$750.



Vim Model 20-F, 1000-lb. Open Express, \$695.
Also Standard De Luxe, \$725; Fore Door De Luxe, \$765; Enclosed Cab De Luxe, \$795; De Luxe with Wire Door and Tail Gate, \$745; Express with Cab Top, \$695; Undertaker's Panel, \$875; U. S. Mail, \$785; Salesman's Express, \$775.



Lippard-Stewart Model M, 1000-lb. Panel, \$1150.
Also Flareboard, \$1125; Screen Side Express, \$1145; Covered Flareboard, \$1125.



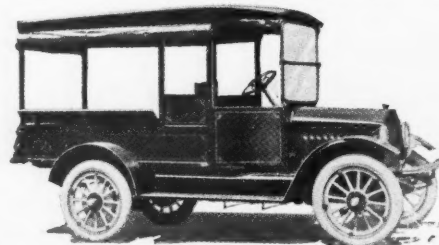
Pennsy Model 18, 1000-lb. Panel, \$750.
Also Flareboard, \$750; Screen Side Express, \$750; Covered Flareboard, \$750.



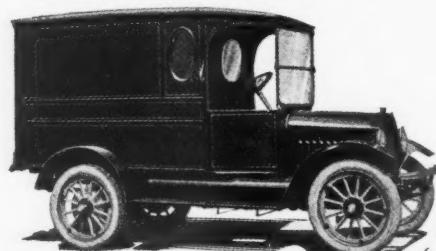
Vim Model 20 H, 1000-lb. Express with Cab Top, \$695.
Also Standard De Luxe, \$725; Fore Door De Luxe, \$765; Enclosed Cab De Luxe, \$795; De Luxe with Wire Door and Tail Gate, \$745; Undertaker's Panel, \$875; U. S. Mail, \$785; Salesman's Express, \$775.

BODY DETAILS OF CARS NOT ILLUSTRATED

Metz 500-lb. Flareboard, \$550.
Also Panel, \$600.
Bell Model 17, 1000-lb. Flareboard, \$825.
Also Panel, \$875.
Croce 1000-lb. Stake, \$850.
Also Flareboard, \$875; Panel, \$885; Screen Side Express, \$890; Covered Flareboard, \$890.
Rainier 1000-lb. Covered Flareboard, \$975.
Also Stake, \$950; Open Flareboard, \$950; Panel, \$975; Screen Side Express, \$975.



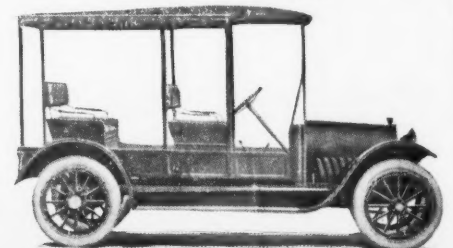
Rush Model D, 1000-lb. Covered Flareboard, \$770.
Also Panel, \$795.



Rush Model D, 1000-lb. Panel, \$795.
Also Covered Flareboard, \$770.



Kearns Model A, 1000-lb. Panel, \$785.
Also Flareboard, \$750.



Hatfield 1000-lb. Utility Wagon, \$800.
Made by Cortland Cart & Carriage Co.

500 Pound Gasoline

Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
.....	500	Metz Co., Waltham, Mass.	O 24	4	3.87	4	B	T	V	A	M	DX

750 Pound Gasoline

75-B	1657	Willys-Overland Co., Toledo, Ohio.	O 18	4	3.37	5	B	T	C	T	B	C
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1000 Pound Gasoline

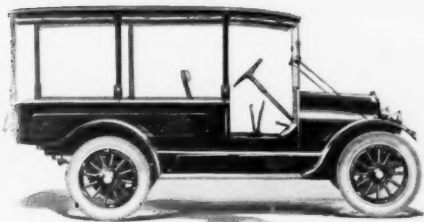
17	Bell Motor Car Co., York, Pa.	Y 20	4	3.5	5	B	T	C	C	B	A
.....	1350	Cortland Cart & Carriage Co., Sydney, N. Y.	G 23	4	3.75	4.75	B	T	C	SB	B	..
17	2400	835	Croce Automobile Co., Asbury Park, N. J.	S 17	4	3.25	5	B	C	H	Z	M	B
A	1450	625	Kearns Motor Truck Co., Beavertown, Pa.	Y 17	4	3.25	5	B	..	C	C	B	C
M	1950	1000	Lippard-Stewart Motor Car Co., Buffalo, N. Y.	S 17	4	3.25	5	B	W	C	Z	M	BL
18	1550	680	Pennsy Motors Co. of Pittsburgh, Pa.	L 16	4	3.12	4.5	B	T	..	Z	M	EX
.....	....	....	Pullman Motor Car Co., York, Pa.	G 23	4	3.75	4.25	B	T	C	SB	M	DX
.....	2100	875	Rainier Motor Corp., New York City.	E 17	4	3.25	4.5	B	T	Z	C	M	DX
D	2250	695	Rush Motor Truck Co., Philadelphia, Pa.	Y 17	4	3.25	5	B	T	V	C	B	C
20	1700	645	Vim Motor Truck Co., Philadelphia, Pa.	O 14	4	3	4.5	B	T	V	O	M	DX

1200 Pound Gasoline

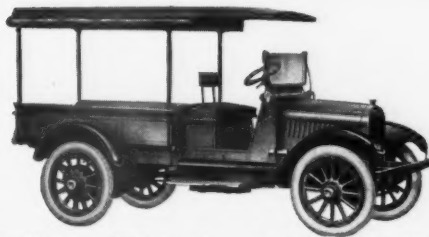
1250	2100	825	Kentucky Wagon Co., Louisville, Ky.	Y 17	4	3.25	5	B	T	C	C	B	C
83-BOE	1760	....	Willys-Overland Co., Toledo, Ohio.	O 27	4	4.12	4.5	B	T	C	T	M	DX

1500 Pound Gasoline

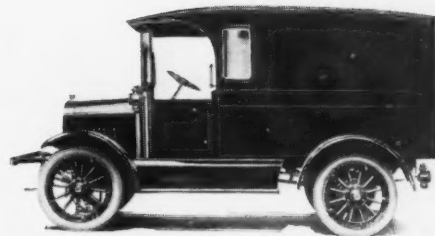
H	....	950	Brinton Motor Truck Co., Philadelphia, Pa.	S 17	4	3.25	5	B	W	T	R	M	BL
25	1650	875	Champion Wagon Co., Inc., Owego, N. Y.	.. 17	4	3.25	5	B	T	T	C	B	..
G	3000	1100	Corbitt Automobile Co., Henderson, N. C.	C 20	4	3.5	5	B	T	V	SB	M	E
Collier	2150	800	Collier Motor Truck Co., Painesville, Ohio.	Y 17	4	3.25	5	B	..	..	C	S	..
J	2000	895	Day-Elder Motors Co., Newark, N. J.	L 16	4	3.12	4.5	B	T	T	SL	M	DX



Overland Model 83 BO2, 1200-lb. Covered Flareboard, \$775.
Made by Willys-Overland Co.



Old Hickory 1200-lb. Covered Flareboard, \$940.
Also Flareboard, \$865.
Made by Kentucky Wagon Mfg. Co.



Vim Model 20A, 1000-lb. Fore Door De Luxe, \$765.

Also Standard De Luxe, \$765; Enclosed Cab De Luxe, \$795; De Luxe with Wire Door and Tail Gate, \$745; Open Express, \$695; Express with Cab Top, \$695; Undertaker's Panel, \$875; U. S. Mail, \$785; Salesman's Express, \$775.

Commercial Car

Spark-Plug Size	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
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3	F	..	F	Metz Co., Waltham, Mass.	Q 7	O	30x3 1/2*	30x3 1/2*	L	C	108	GD	..
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Commercial Car

1 1/2	F	C	B	Willys-Overland Co., Toledo, Ohio.	O 3	O	31x4*	31x4*	O	C	104	AL	..
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Commercial Cars

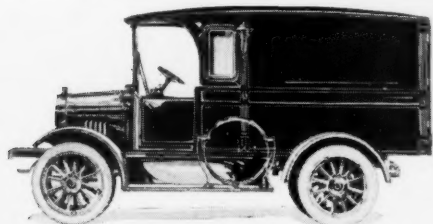
S	S	D	B	Bell Motor Car Co., York, Pa.	C 3	F	31x4	31x4	L	C	112	GD	55
S	F	D	B	Cortland Cart & Carriage Co., Sydney, N. Y.	G 3	P	31x4*	31x4*	L	C	106	ES	40
S	F	D	B	Croce Automobile Co., Asbury Park, N. J.	E 3	T	32x4	32x4	L	C	108	..	60
M	F	D	B	Kearns Motor Truck Co., Beavertown, Pa.	S 3	F	33x3 1/2*	31x4*	O	C	107	DY	70
S	S	C	W	Lippard-Stewart Motor Car Co., Buffalo, N. Y.	C 3	T	33x4*	33x4*	L	C	106	R	70
..	F	D	B	Pennsy Motors Co. of Pittsburgh, Pa.	S 3	S	30x3 1/2*	31x4*	L	C	98	..	90
S	S	D	B	Pullman Motor Car Co., York, Pa.	S 3	F	31x4*	31x4*	L	C	114	A	..
..	F	D	W	Rainier Motor Corp., New York City.	G 3	T	33x4*	33x4*	L	C	115	SD	80
S	S	D	B	Rush Motor Truck Co., Philadelphia, Pa.	S 3	3/4	31x4*	31x4*	L	C	105	SD	..
S	F	C	B	Vim Motor Truck Co., Philadelphia, Pa.	S 3	O	31x4*	31x4*	L	C	102	..	..

Commercial Cars

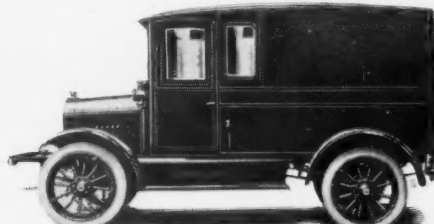
S	S	C	B	Kentucky Wagon Co., Louisville, Ky.	G 3	L	33x4*	33x4*	L	C	112	DY	60
1 1/2	F	C	D	Willys-Overland Co., Toledo, Ohio.	O 3	O	33x4 1/2*	32x4 1/2*	L	C	106	AL	..

Commercial Cars

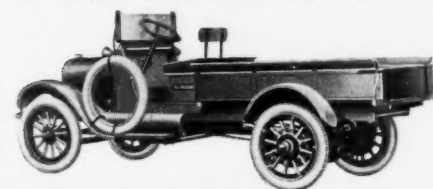
..	F	D	W	Brinton Motor Truck Co., Philadelphia, Pa.	3	..	33x4	33x4	L	C	115	..	..
S	F	D	B	Champion Wagon Co., Inc., Cwego, N. Y.	S	F	32x3 1/2	33x4	L	C	114	DY	..
..	F	D	W	Corbitt Automobile Co., Henderson, N. C.	S 3	..	34x3	34x3 1/2	L	C	130	..	..
S	..	D	..	Collier Motor Truck Co., Painesville, Ohio.	S 3	L	33x4*	33x4*	L	C	118	DY	60
S	F	D	W	Day-Elder Motors Co., Newark, N. J.	S 3	S	33x4*	33x4*	L	C	108	AC	70



Vim Model 20 U, 1000-lb. Undertaker's Panel, \$875.
Also Standard De Luxe, \$725; Fore Door De Luxe, \$765; Enclosed Cab De Luxe, \$795; De Luxe with Wire Door and Tail Gate, \$745; Open Express, \$695; Express with Cab Top, \$695; U. S. Mail, \$785; Salesman's Express, \$775.



Vim Model 20 G, Enclosed Cab De Luxe, \$795.
Also Standard De Luxe, \$725; Fore Door De Luxe, \$765; De Luxe with Wire Door and Tail Gate, \$745; Open Express, \$695; Express with Cab Top, \$695; Undertaker's Panel, \$875; U. S. Mail, \$785; Salesman's Express, \$775.



Old Hickory 1200-lb. Flareboard, \$865.
Also Covered Flareboard, \$940.
Made by Kentucky Wagon Mfg. Co.

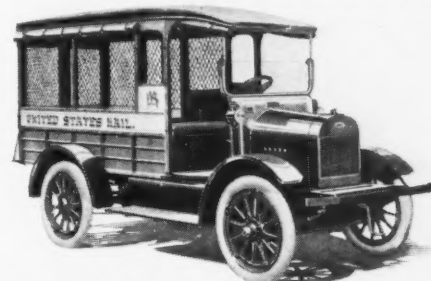


Brinton Model H, 1500-lb. Covered Flareboard, Chassis, \$950.



Vim Model 20 P, 1000-lb. Standard De Luxe, \$725.

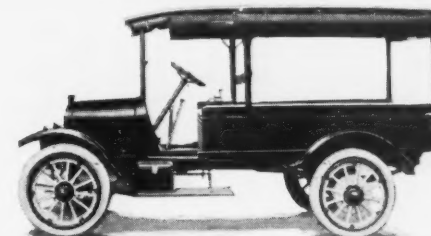
Also Fore Door De Luxe, \$765; Enclosed Cab De Luxe, \$795; De Luxe with Wire Door and Tail Gate, \$745; Open Express, \$695; Express with Cab Top, \$695; Undertaker's Panel, \$875; U. S. Mail, \$785; Salesman's Express, \$775.



Vim Model 20 M, U. S. Mail Express, \$785.
Also Standard De Luxe, \$725; Fore Door De Luxe, \$765; Enclosed Cab De Luxe, \$795; De Luxe with Wire Door and Tail Gate, \$745; Undertaker's Panel, \$875; Salesman's Express, \$775; Express with Cab Top, \$695; Open Express, \$695.

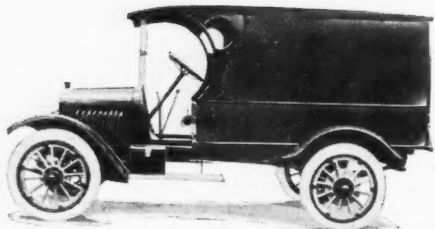


Vim Model 20-B, De Luxe with Wire Door and Tail Gate, \$745.
Also Standard De Luxe, \$725; Fore Door De Luxe, \$765; Enclosed Cab De Luxe, \$795; Open Express, \$695; Express with Cab Top, \$695; Undertaker's Panel, \$875; U. S. Mail, \$785; Salesman's Express, \$775.

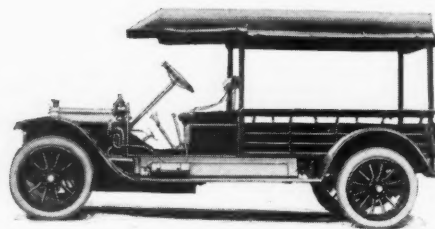


Day-Elder Model J, 1500-lb. Flareboard, \$1070.
Also Panel, \$1020; Screen Side Express, \$1030; Covered Flareboard, \$1005.

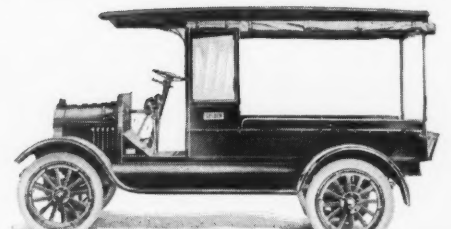
BODY DETAILS OF CARS NOT ILLUSTRATED
Collier 1500-lb. Stake, \$895.
Also Flareboard, \$895; Panel, \$895; Screen Side Express, \$895; Covered Flareboard, \$895.
Champion Model 25, 1500-lb. Chassis, \$875.



Day-Elder Model J, 1500-lb. Panel, \$1020.
Also Flareboard, \$1070; Screen Side Express,
\$1030; Covered Flareboard, \$1005.



*White Model GBBE, 1500-lb. Chassis, \$2100.



Selden Model G, 1500-lb. Covered Flareboard,
Chassis, \$950.

1500 Pound Gasoline

Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
15A	2650	1190	Hoover Wagon Co., York, Pa.										
B	2650	1500	G 23 4	3.75	4.25	B	T	C	SL	M	DX		
B	2650	1500	Lippard-Stewart Motor Car Co., Buffalo, N. Y.										
W	2700	1600	C 23 4	3.75	5.25	B	W	C	Z	M	E		
W	2700	1600	C 23 4	3.75	5.25	B	W	C	Z	M	E		
W	2700	1600	C 23 4	3.75	5.25	B	W	C	Z	M	E		
Atlas	2000	750	Martin Carriage Works, York, Pa.										
O	2700	1290	Y 17 4	3.25	5	B	T	T	C	M	..		
G	1900	985	Sanford Motor Truck Co., Syracuse, N. Y.										
6	1800	795	B 20 4	3.5	5.12	B	T	T	SL	M	DX		
GBBE	2960	2100	Selden Motor Vehicle Co., Rochester, N. Y.										
			L 16 4	3.12	4.5	B	T	P	SL	M	DX		
			Stewart Motor Corp., Buffalo, N. Y.										
			T 14 4	3	4.25	B	T	T	Z	M	DX		
			White Motor Co., Cleveland, Ohio.										
			O 22 4	3.75	5.12	B	C	H	O	M	E		

1 Ton Gasoline

7-B	4490	....	Atterbury Motor Car Co., Buffalo, N. Y.										
U	....	2000	C 22 4	3.75	5.25	B	C	T	Z	M	E		
G	3300	975	C. L. Barker, Norwalk, Conn.										
O	3480	1500	.. 26 4	4	5	..	T	T	SB	M	E		
O	3480	1500	Bessemer Motor Truck Co., Grove City, Pa.										
A	3900	1650	C 20 4	4.5	5	B	T	C	SL	M	B		
26	2900	1500	Brockway Motor Truck Co., Cortland, N. Y.										
27	....	1625	C 20 4	3.5	5	B	T	V	SL	M	B		
E	3000	1300	C 20 4	3.5	5	B	T	V	SL	M	B		
S	3000	1450	Chase Motor Truck Co., Syracuse, N. Y.										
C	....	1600	U 20 4	3.5	5.25	B	C	T	..	M	..		
75	3300	1450	Commercial Truck Co., Cleveland, Ohio.										
.....	4150	1650	X 18 4	3.37	5	S	T	V	SB	M	B		
Mack	4600	2000	X 18 4	3.37	5	S	T	V	SB	M	B		
Mack	4600	2000	Corbitt Automobile Co., Henderson, N. C.										
Mack	4500	2000	C 22 4	3.75	5	B	T	V	SB	M	E		
Mack	4500	2000	Day-Elder Motors Co., Newark, N. J.										
K	2900	895	C 20 4	3.5	5	B	T	T	Z	M	DX		
C	4200	1850	Gabriel Auto Co., Cleveland, Ohio.										
.....	3400	1550	B 30 4	4	5.5	B	C	H	..	M	B		
			Garford Motor Truck Co., Lima, Ohio.										
			B 20 4	3.5	5.12	B	T	C	R	M	DX		
			Gramm-Bernstein Co., Lima, Ohio.										
			U 23 4	3.75	5.25	B	T	V	Z	M	E		
			International Motor Truck Co., New York City.										
			O 26 4	4	5	P	C	H	SB	M	DX		
			O 26 4	4	5	P	C	H	SB	M	DX		
			O 26 4	4	5	P	C	H	SB	M	DX		
			O 26 4	4	5	P	C	H	SB	M	DX		
			H. J. Koehler Motors Corp., Newark, N. J.										
			O 20 4	4.5	5	B	T	V	P	M	..		
			Lange Motor Truck Co., Pittsburgh, Pa.										
			C 27 4	3.75	5.25	B	T	H	SB	M	B		
			Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.										
			C 23 4	3.75	5	B	T	T	SL	M	..		



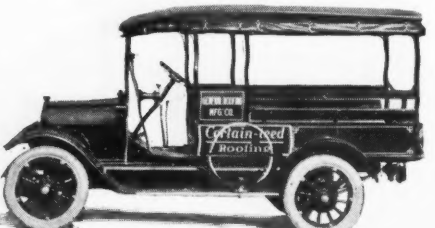
Chase Model A, 1-ton Covered Express, Chas-
sis, \$1650.
Also Stake, \$1765; Flareboard, \$1730; Panel,
\$1950.



Lippard-Stewart Model H, 1500-lb. Covered
Flareboard, \$1725.
Also Stake, \$1750; Flareboard, \$1725; Panel,
\$1750; Screen Side Express, \$1745.



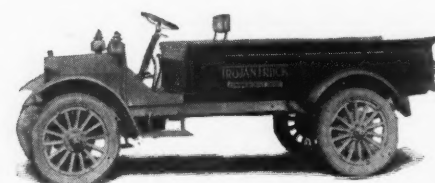
Atlas 1500-lb. Panel, \$849.
Also Covered Flareboard, \$834; Screen Side
Express, \$849; Flareboard, \$829.
Made by Martin Carriage Works.



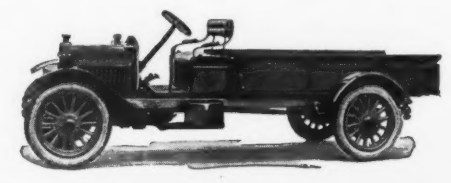
.. Atlas 1500-lb. Covered Flareboard, \$834.
Also Panel, \$849; Flareboard, \$829; Screen Side
Express, \$849.
Made by Martin Carriage Works.



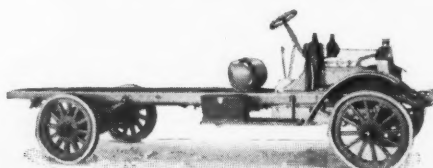
Brockway Model O, 1-ton Covered Express,
\$1675.
Also Stake, \$1535; Open Flareboard, \$1510; Pan-
el, \$1660; Screen Side Express, \$1700; Covered
Flareboard, \$1580.



Trojan Model 26, 1-ton Flareboard, \$1615.
Also Stake, \$1663; Covered Flareboard, \$1675.
Made by Commercial Truck Co.



Sanford Model R, 1-ton Flareboard, \$1330.

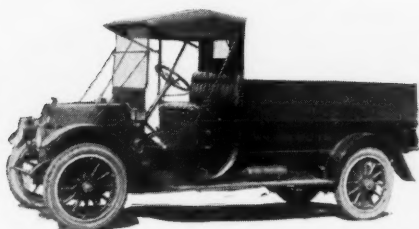


Maccar Model L, 1-ton Chassis, \$2100.

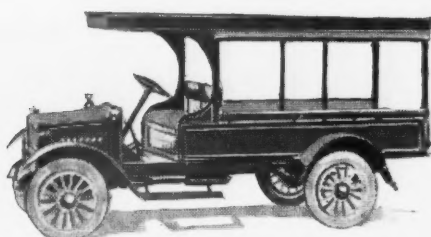


Lange Model C, 1-ton Panel, Chassis, \$1850.

FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE



*Gabriel Model C, 1-ton Chassis, \$1600.



Hoover Model 15-A, 1500-lb. 6 Post Body, \$1315.
Also Swell Side Panel, \$1340.



**Lippard-Stewart Model H, 1-ton Flareboard,
\$2250.**

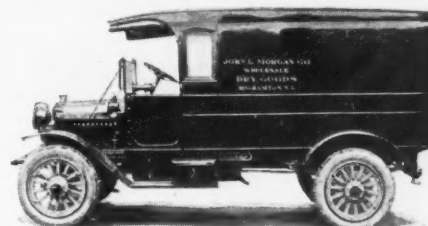
Commercial Cars

Spark-Plug Size	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
S	F	D	W	Hoover Wagon Co., York, Pa.									
				D	3	N	32x4*	32x4½*	L	C	120	..	85
				Lippard-Stewart Motor Car Co., Buffalo, N. Y.									
S	S	C	B	B	3	T	35x4½*	35x4½*	L	C	125	DY	70
S	S	C	B	B	3	T	35x4½*	35x4½*	L	C	135	DY	70
S	S	C	B	B	3	T	35x4½*	35x4½*	L	C	125	DY	70
S	S	C	W	B	3	T	35x4½*	35x4½*	L	C	135	DY	70
				Martin Carriage Works, York, Pa.									
S	F	D	B	S	3	F	31x4*	31x4*	L	C	106	..	..
				Sanford Motor Truck Co., Syracuse, N. Y.									
S	F	D	L	B	3	R	36x3	36x3½	L	C	120	..	..
				Selden Motor Vehicle Co., Rochester, N. Y.									
S	S	D	W	D	3	N	32x3½*	33x4*	R	C	110	AC	70
				Stewart Motor Corp., Buffalo, N. Y.									
S	F	D	I	S	3	Q	32*	32*	L	C	110	..	66
				White Motor Co., Cleveland, Ohio.									
M	G	D	B	S	4	O	34x4½*	34x4½*	L	C	134	..	..



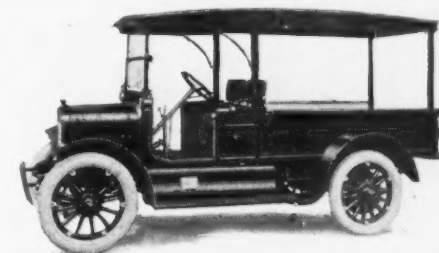
Day-Elder Model S, 1-ton Stake, \$1615.

Also Flareboard, \$1665; Panel, \$1675; Screen Side Express, \$1650; Covered Flareboard, \$1600.



Brockway Model O, 1-ton Panel, \$1770.

Also Stake, \$1535; Open Flareboard, \$1510; Panel, \$1660; Screen Side Express, \$1700; Covered Flareboard, \$1580.



**Stewart Model 6, 1500-lb. Covered Flareboard,
\$870.**

Also Express, \$870; Panel, \$920.



**Stewart Model 3, 1-ton Screen Side Express,
\$1565.**

Also Panel, \$1590; Covered Flareboard, \$1515.

BODY DETAILS OF CARS NOT ILLUSTRATED
Hoover Model 1500-A, 1500-lb. Swell Side Panel,
\$1340.

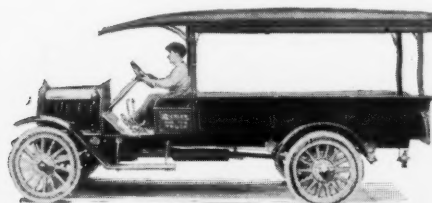
Also 6 Post Body, \$1315.
Lippard-Stewart Model B, 1500-lb. Stake, \$1650.
 Also Flareboard, \$1625; Panel, \$1650; Screen
 Side Express, \$1645; Covered Flareboard, \$1625.

Atterbury Model 7B, 1-ton Chassis, \$1875.
Barker Model U, 1-ton Stake, \$2100.
 Also Flareboard, \$2100; Panel, \$2100; Screen Side
 Express, \$2125; Covered Flareboard, \$2125.

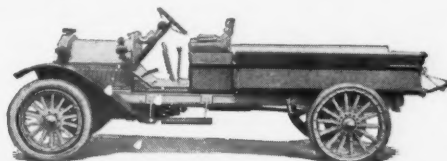
Stewart Model 6, 1500-lb. Panel, \$920.
Also Covered Flareboard, \$870; Express, \$870.
Trojan Model 27, 1-ton Stake, \$1788.
Also Flareboard, \$1740; Covered Flareboard,
\$1800.

Made by Commercial Cars Co.

Larrabee 1-ton Flareboard, Chassis, \$1550.



Koehler Model K, 1-ton Flareboard,
Chassis, \$895.



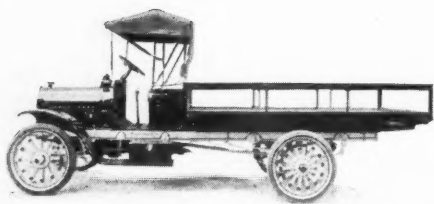
Sanford Model O, 1500-lb. Flareboard, \$1350.



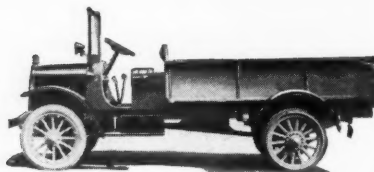
**Bessemer Model G. 1-ton Flareboard,
Chassis. \$1075.**



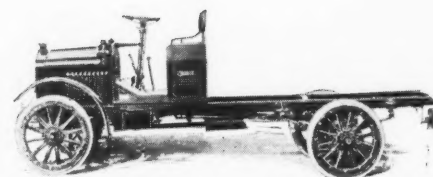
Gramm-Bernstein 1-ton Panel, Chassis, \$1650.



Superior Model A, 1-ton Flareboard, \$1500.
Also Stake, \$1435; Flareboard, \$1410.
Made by E. G. Willingham's Sons.

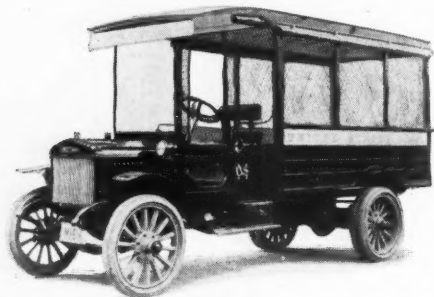


Denmo Model 10, 1 1/4-ton Flareboard, \$1475.
Also Stake, \$1510.
Made by Denneen Motor Co.



Selden Model TL, 1-ton Chassis, \$1700.

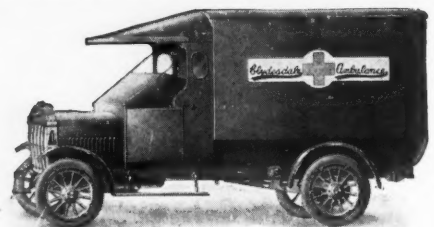
1 Ton Gasoline



Brockway Model J2, 1 1/2-ton Screen Side Express, \$2150.
Also Stake, \$1910; Open Flareboard, \$1885; Panel, \$2035; Covered Flareboard, \$1955.



Gramm-Bernstein 1 1/2-ton Box Body, \$2235.

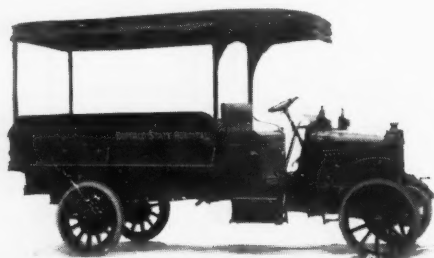


Clydesdale Model L-25, 1 1/4-ton Panel, Chassis, \$1050.

Made by Fulton Motor Truck Co.



Witt-Will Model WD-1-17, 1 1/4-ton Covered Flareboard, \$2000.
Also Stake, \$1950; Flareboard, \$2000; Panel, \$2000.



*Atterbury Model 7R, 1 1/2-ton Chassis, \$2075.

Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
H	3400	2000	Lippard-Stewart Motor Car Co., Buffalo, N. Y.	23	4	3.75	5.25	B	C	Z	M	E	
L	4000	2100	Maccar Truck Co., Scranton, Pa.	27	4	4.12	5.25	B	C	V	SB	M	B
.....	....	1175	Niles Car & Mfg. Co., Niles, Ohio.	..	..	..	..	..	..	H	SB	M	E
M	3800	1075	Palmer-Moore Co., Syracuse, N. Y.	20	4	3.5	5.12	B	T	V	Z	M	B
B1	....	....	Royal Motor Truck Co., New York City.	17	4	3.25	5	B	G	H	MS	M	B
3	2900	1390	Stewart Motor Corp., Buffalo, N. Y.	20	4	3.5	5.12	B	T	T	Z	M	DX
R	3000	1370	Sanford Motor Truck Co., Syracuse, N. Y.	20	4	3.5	5.12	B	T	T	SL	M	DX
TL	3750	1700	Selden Motor Vehicle Co., Rochester, N. Y.	20	4	3.5	5	B	T	T	SB	M	B
TCL	3500	....	Trabold Truck Mfg. Co., Johnstown, Pa.	20	4	3.5	5.12	B	W	H	SB	M	DX
T	3500	950	..	20	4	3.5	5.12	B	W	H	SB	M	DX
T	3500	1050	E. G. Willingham's Sons, Atlanta, Ga.	20	4	3.5	5	B	T	V	SB	M	E
A	2680	1350	Witt-Will Co., Inc., Washington, D. C.	23	4	3.75	5.25	B	C	H	Z	M	E
WD-1-17	3500	1850	..	..	..	..	..	..	..	..	..	..	..

1 1/4 Ton Gasoline

L-25	2500	1050	Fulton Motor Truck Co., New York City.	20	4	3.5	5	B	T	T	Z	M	..
10	3050	1385	Denneen Motor Co., Cleveland, Ohio.	23	4	3.75	5	B	T	C	S	M	DX
10	3050	1455	..	23	4	3.75	5	B	T	C	S	M	DX

1 1/2 Ton Gasoline

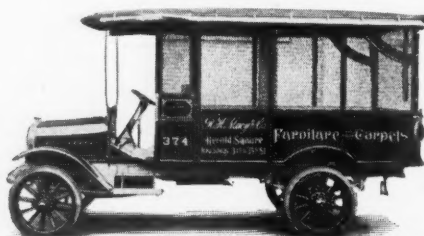
7R	4680	....	Atterbury Motor Car Co., Buffalo, N. Y.	22	4	3.75	5.25	B	C	T	Z	M	E
J-2	4000	1875	Brockway Motor Truck Co., Cortland, N. Y.	23	4	3.75	5	B	T	V	SL	M	B
J-2	4000	1875	..	23	4	3.75	5	B	T	V	SL	M	B
C	....	1950	Chase Motor Truck Co., Syracuse, N. Y.	20	4	3.5	5.25	B	C	T	..	M	..
.....	....	1000	Fulton Motor Truck Co., Farmingdale, L. I.	23	4	3.75	4.25	B	W	..	..	M	E
L30	2400	1200	Fulton Motor Truck Co., New York City.	20	4	3.5	5	B	T	T	Z	M	..
D	4000	2150	Corbitt Automobile Co., Henderson, N. C.	23	4	3.75	5.25	B	C	T	SB	M	E
SS	3250	1800	Day-Elder Motors Co., Newark, N. J.	23	4	3.75	5	B	T	T	Z	M	DX
D	....	2000	Gabriel Auto Co., Cleveland, Ohio.	35	4	4.25	5.5	B	C	H	..	M	B



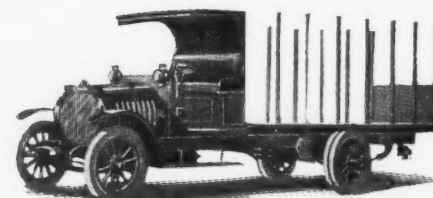
Kelly-Springfield Model K32, 1 1/2-ton Chassis, \$2000.
Also Stake, \$2150; Flareboard, \$2090; Panel, \$2140; Screen Side Express, \$2250; Covered Flareboard, \$2200.



Schacht 1 1/2-ton Flareboard, Chassis, \$2650.



Mack Model AB, 1-ton Worm Drive Screen Side Express, Chassis, \$2000.
Made by International Motor Co.



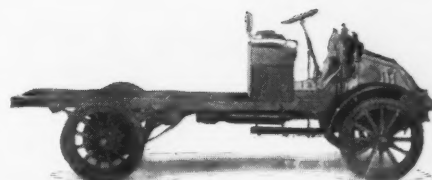
Clydesdale Model L-30, 1 1/2-ton Stake, Chassis, \$1200.
Made by Fulton Motor Truck Co.



New York Model M, 1 1/2-ton Chassis, \$2000.
Made by Tegetmeier & Riepe Co.



Krebs Model 40, 1 1/2-ton Chassis, \$2050.



Kelly-Springfield Model K31, 1 1/2-ton Chassis, \$2000.
Also Stake, \$2150; Flareboard, \$2090; Panel, \$2140; Screen Side Express, \$2250; Covered Flareboard, \$2200.

Commercial Cars

Spark-Plug Size	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels		
S	S	C	W	Lippard-Stewart Motor Car Co., Buffalo, N. Y.				B 3 T	36x3	36x5	..	C	145	DY	70
S	F	D	W	Maccar Truck Co., Scranton, Pa.				B 3 F	36x4	36x5	L	C	150	..	85
..	..	..	..	Niles Car & Mfg. Co., Niles, Ohio.				.. T	..	..	..	..	..	..	..
S	F	D	I	Palmer-Moore Co., Syracuse, N. Y.				C 3 Q	34x3	34x4	L	C	126	..	70
S	F	D	W	Royal Motor Truck Co., New York City.				I 3 S	34x4	34x5	R	R	124	..	70
S	F	D	I	Stewart Motor Corp., Buffalo, N. Y.				S 3 Q	34x3 1/2	34x4	L	C	118	..	74
S	F	P	I	Sanford Motor Truck Co., Syracuse, N. Y.				B 3 R	36x3 1/2	36x4	L	C	138	..	..
S	S	D	W	Selden Motor Vehicle Co., Rochester, N. Y.				B 3 T	34x3	34x4	R	C	126	NE	68
S	S	D	I	Trabold Truck Mfg. Co., Johnstown, Pa.				C 3 U	34x3	34x4	R	C	131	NE	71
S	S	D	I	..				S 3 D	34x4	36x4	L	C	124	..	75
S	S	D	I	..				S 3 D	34x4	36x4	L	C	145	..	75
S	F	D	I	E. G. Willingham's Sons, Atlanta, Ga.				C 3 B	34x4 1/2	34x4	L	C	144	..	..
S	F	D	W	Witt-Will Co., Inc., Washington, D. C.				S 3 F	36x3 1/2	36x4	L	C	120	..	..

Commercial Cars

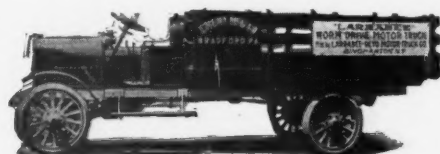
S	F	D	B	Fulton Motor Truck Co., New York City.	S 3 S	33x4 1/2	33x4 1/2	R	C	122	..	..
S	F	D	I	Denneen Motor Co., Cleveland, Ohio.	S 3 F	34x4 1/2	34x4	L	C	124	SD	63
S	F	D	I	..	S 3 F	34x4 1/2	34x4	L	C	140	SD	63

Commercial Cars

S	F	D	W	Atterbury Motor Car Co., Buffalo, N. Y.	S 4 F	36x3 1/2	36x5	R	R	140	..	75
S	S	C	W	Brockway Motor Truck Co., Cortland, N. Y.	S 3 N	36x3 1/2	36x5	L	C	124	..	70
S	S	C	W	..	S 3 N	36x3 1/2	36x5	L	C	140	..	70
S	F	D	W	Chase Motor Truck Co., Syracuse, N. Y.	S 3 S	36x3 1/2	36x6	L	C	138	..	82
..	F	D	I	Fulton Motor Truck Co., Farmingdale, L. I.	..	34x3 1/2	34x3 1/2 D	L	C	134	..	..
S	F	D	I	Fulton Motor Truck Co., New York City.	S 3 ..	34x5	34x3 D	R	C	122	..	..
S	F	D	W	Corbitt Automobile Co., Henderson, N. C.	S 3 S	36x3 1/2	36x5	L	C	138	..	75
S	F	D	W	Day-Elder Motors Co., Newark, N. J.	S 3 S	34x4	34x5	L	C	140	..	70
S	F	C	W	Gabriel Auto Co., Cleveland, Ohio.	S 4 F	36x5	36x5	L	C	136	..	70



Lippard-Stewart Model F, 1 1/2-ton Covered Flareboard, \$2525.



Larrabee 1 1/2-ton Stake, Chassis, \$2000.



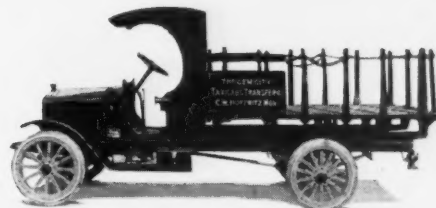
Niles Model B, 1-ton Open Flareboard, \$1275.



*Gabriel Model D, 1 1/2-ton Chassis, \$2000.



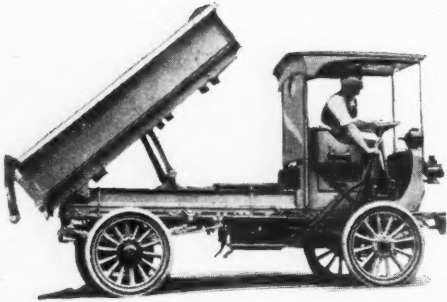
Mack Model AB, 1 1/2-ton Worm Drive Covered Express, Chassis, \$2350.
Made by International Motor Co.



Stewart Model 4, 1 1/2-ton Stake, \$1625.
Also Open Flareboard, \$1565; Screen Side Express, \$1685; Covered Flareboard, \$1645.

BODY DETAILS OF CARS NOT ILLUSTRATED

Clyde 1 1/2-ton Chassis, \$1000.
Day-Elder Model SS, 1 1/2-ton Stake, \$1975.
Also Flareboard, \$1975; Panel, \$2050; Screen Side Express, \$2020; Covered Flareboard, \$1960.



Autocar 2-ton Power Dump, Chassis, \$1650.
Also Panel, \$1850; Screen Side Express, \$1850;
Stake, \$1865; Covered Flareboard, \$1875; Coal
Body with Power Lift Attachment, \$2150; With
Cab, \$2195; Screen Side Express, \$1890.



Autocar 2-ton Coal Body with Power Lift At-
tachment, Chassis, \$1650.
Also Panel, \$1850; Screen Side Express, \$1850;
Stake, \$1865; Covered Flareboard, \$1875; Power
Dump Body, \$2150; With Cab, \$2195; Screen
Side Express, \$1890.



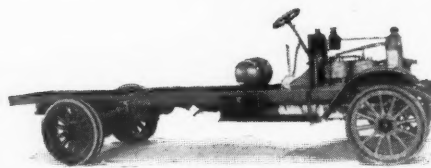
Autocar 2-ton Stake, Chassis, \$1650.
Also Covered Flareboard, \$1875; Panel, \$1850;
Screen Side Express, \$1850; Coal Body with
Power Lift Attachment, \$2150; With Cab, \$2195;
Power Dump Body, \$2150; With Cab, \$2195;
Screen Side Express, \$1890.



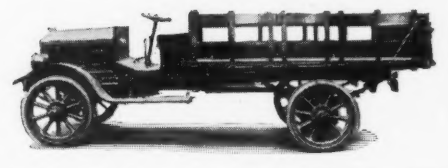
Autocar 2-ton Panel, Chassis, \$1650.
Also Stake, \$1865; Covered Flareboard, \$1875;
Screen Side Express, \$1850; Coal Body with Pow-
er Lift Attachment, \$2150; With Cab, \$2195;
Power Dump Body, \$2150; With Cab, \$2195;
Screen Side Express, \$1890.



Autocar 2-ton Covered Flareboard, Chassis,
\$1650.
Also Stake, \$1865; Panel, \$1850; Screen Side Ex-
press, \$1850; Coal Body with Power Lift At-
tachment, \$2150; With Cab, \$2195; Power Dump
Body, \$2150; With Cab, \$2195; Screen Side Ex-
press, \$1890.



Maccar Model H, 2-ton Chassis, \$2600.



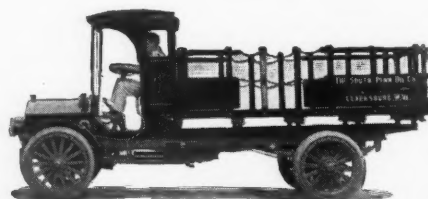
American Model C, 2-ton Stake, Chassis, \$2800.

1½ Ton Gasoline

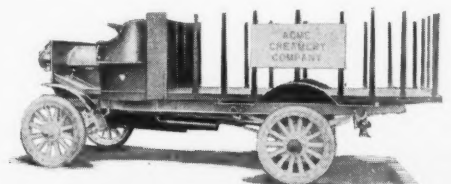
Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
66	4180	1800	Garford Motor Truck Co., Lima, Ohio.										
.....	4490	2000	B 23	4	3.75	5.5	B	C	C	R	M	DX	
.....	4220	2250	Gramm-Bernstein Co., Lima, Ohio.										
.....	4220	2250	U 23	4	3.75	5.25	B	T	V	Z	M	E	
			Hurlburt Motor Truck Co., New York City.										
			B 23	4	3.75	5.5	B	C	C	F	M	E	
			B 23	4	3.75	5.5	B	C	C	F	M	E	
			International Motor Truck Co., New York City.										
Mack	5000	2350	O 26	4	4	5	P	C	H	SB	M	DX	
Mack	5000	2350	O 26	4	4	5	P	C	H	SB	M	DX	
Mack	4900	2350	O 26	4	4	5	P	C	H	SB	M	DX	
Mack	4900	2350	O 26	4	4	5	P	C	H	SB	M	DX	
			Kelly-Springfield Motor Truck Co., Springfield, Ohio.										
K31	4590	2000	O 23	4	3.75	5.25	B	C	C	R	M	E	
K31	4590	2000	O 23	4	3.75	5.25	B	C	C	R	M	E	
K31	4590	2000	O 23	4	3.75	5.25	B	C	C	R	M	E	
K32	5000	2000	O 23	4	3.75	5.25	B	C	C	R	M	E	
K32	5000	2000	O 23	4	3.75	5.25	B	C	C	R	M	E	
K32	5000	2000	O 23	4	3.75	5.25	B	C	C	R	M	E	
40	4350	2050	Krebs Commercial Car Co., Clyde, Ohio.										
.....	4300	2000	C 27	4	4.12	5.25	B	C	V	Z	M	B	
			Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.										
			C 27	4	4.12	5.25	B	C	T	SL	M	..	
F	4500	2300	Lippard-Stewart Motor Car Co., Buffalo, N. Y.										
F	4500	2300	C 27	4	4.12	5.25	B	C	C	Z	M	E	
			C 27	4	4.12	5.25	B	C	C	Z	M	E	
	5200	2650	G. A. Schacht Motor Truck Co., Cincinnati, Ohio.										
			B 29	4	4.25	5.5	B	C	C	SL	M	B	
4	3400	1485	Stewart Motor Corp., Buffalo, N. Y.										
			B 20	4	3.5	5.12	B	T	T	Z	M	DX	
G	3300	1600	Sullivan Motor Truck Corp., Rochester, N. Y.										
			B 27	4	4.12	4.5	B	T	V	H	M	B	
			Tegetmeier & Riepe Co., New York City.										
M	4260	2200	C 27	4	4.12	5.25	B	C	H	SB	M	B	

2 Ton Gasoline

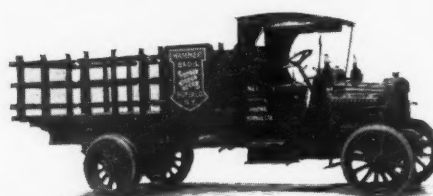
C	4500	2800	American Motor Truck Co., New York City.										
			S	36	4	4.75	5.5	P	C	V	P	M	B
HW	4575	2800	O. Armleder Co., Cincinnati, Ohio.										
AW	4575	2800	C	27	4	4.12	5.25	B	C	C	SL	M	B
			C	27	4	4.12	5.25	B	C	C	SL	M	B
			Atterbury Motor Car Co., Buffalo, N. Y.										
7C	5320	....	C	27	4	4.12	5.25	B	C	T	Z	M	E
			Autocar Co., Ardmore, Pa.										
.....	3600	1650	O	18	2	4.75	4.5	S	C	T	SB	M	B
			C. L. Barker, Norwalk, Conn.										
.....	....	2400	..	26	4	4	5	..	T	..	SB	M	E
			Bessemer Motor Truck Co., Grove City, Pa.										
D	4500	2200	C	27	4	4.12	5.25	B	C	C	R	M	B
D	....	2250	C	27	4	4.12	5.25	B	C	C	R	M	B
			Blair Motor Truck Co., Newark, Ohio.										
C	4500	2850	U	29	4	4.25	5.75	P	C	T	SL	M	B
	4500	2850	U	29	4	4.25	5.75	P	C	T	SL	M	B
C	4500	2850	U	29	4	4.25	5.75	P	C	T	SL	M	B



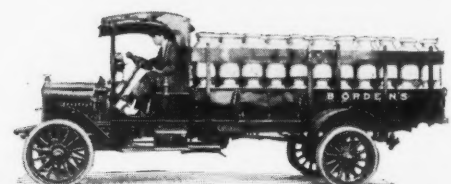
Bessemer Model D, 2-ton Stake, Chassis, \$2200.
With Long Wheelbase, \$2250.



*Blair Model C, 2-ton Chassis, \$2850.



*Atterbury Model 7C, 2-ton Chassis, \$2575.



Brockway Model K2, 2-ton Stake, \$2375.
Also open Flareboard, \$2213; Panel, \$2363; Screen
Side Express, \$2413; Covered Flareboard, \$2303.

FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE



Boune Magnetic Model BM, 2-ton Chassis, \$3150.
Corbitt Model D, 2-ton Stake, \$2275.
Also Flareboard, \$2275; Panel, \$2275; Screen Side Express, \$2275; Covered Flareboard, \$2275.



Hurlburt 2-ton Covered Body, Chassis, \$3000.



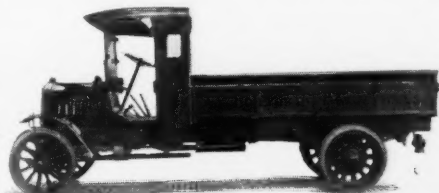
Autocar 2-ton Screen Side Express, Chassis, \$1650.

Commercial Cars

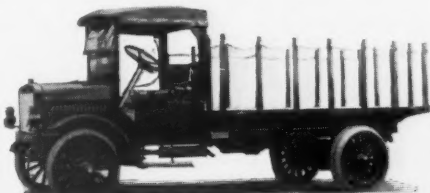
Model	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
Boune Magnetic Model BM	F	D	W	B 3	F	36x3 1/2	36x5	O	C	142	..	..	..
Corbitt Model D	S	D	W	O 3	N	34x3 1/2	36x5	L	C	130	WS	80	80
Hurlburt Motor Truck Co.	F	D	W	S 3	S	34x4	34x5	L	C	136	..	80	80
International Motor Truck Co.	F	D	W	S 3	S	34x4	34x5	L	C	148	..	80	80
Kelly-Springfield Motor Truck Co.	F	D	W	B 3	T	36x4	36x3 1/2 D	L	C	144	B	..	..
Krebs Commercial Car Co.	F	D	W	B 3	T	36x4	36x3 1/2 D	L	C	162	B	..	..
Larrabee-Deyo Motor Truck Co.	F	D	W	B 3	T	36x4	36x3 1/2 D	L	C	144	B	..	..
Lippard-Stewart Motor Car Co.	F	D	W	B 3	T	36x4	36x3 1/2 D	L	C	158	DX	70	70
G. A. Schacht Motor Truck Co.	F	D	W	O 3	O	38x3 1/2	38x5	L	C	138	..	75	75
Stewart Motor Corp.	F	D	W	S 3	Q	34x3 1/2	34x5	L	C	140	..	74	74
Sullivan Motor Truck Corp.	F	D	W	C 3	D	36x3	36x4	L	C	129	..	74	74
Tegetmeier & Riepe Co.	F	D	W	A 3	F	36x3 1/2	36x5	L	C	144	..	70	70

Commercial Cars

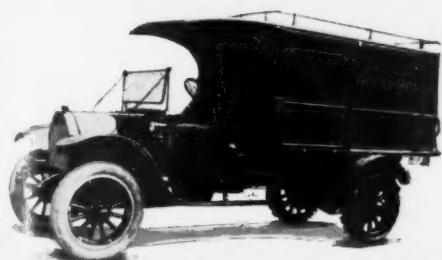
American Motor Truck Co.	F	D	W	S 3	S	36x5	36x6	R	R	144	B	..	..
O. Armleder Co.	F	D	W	S 3	T	36x4	36x7	L	C	148	..	..	..
Atterbury Motor Car Co.	F	D	W	S 4	F	36x4	36x4 D	R	R	153	..	75	75
Autocar Co.	S	D	B	P 3	F	34x4	34x5	R	R	97	..	47	47
C. L. Barker, Norwalk, Conn.	S	..	D	S 4	S	36x4	36x7	L	C	136	..	80	80
Bessemer Motor Truck Co.	S	F	C	E 3	T	37x4	37x4 D	L	C	146	..	57	57
Blair Motor Truck Co.	S	F	C	E 3	T	37x4	37x4 D	L	C	160	..	57	57
Blair Motor Truck Co.	S	F	C	I 3	3/4	34x4	34x3 1/2 D	R	R	121	..	72	72
Blair Motor Truck Co.	S	F	C	I 3	3/4	34x4	34x3 1/2 D	R	R	135	..	72	72
Blair Motor Truck Co.	S	F	C	I 3	3/4	34x4	34x3 1/2 D	R	R	144	..	72	72



Krebs Model 60, 2-ton Flareboard, Chassis, \$2350.



Gramm-Bernstein 2-ton Stake, \$2500.



*Gabriel Model E, 2-ton Chassis, \$2400.



Brockway Model K2, 2-ton Tank, \$2500.
Also Stake, \$2235; Flareboard, \$2213; Panel, \$2263; Screen Side Express, \$2413; Covered Flareboard, \$2303.



Autocar 2-ton Screen Side Express, Chassis, \$1650.

Also Panel, \$1850; Screen Side Express, \$1850; Stake, \$1865; Covered Flareboard, \$1875; Coal Body with Power Lift Attachment, \$2150; With Cab, \$2195; Power Dump Body, \$2150; With Cab, \$2195.

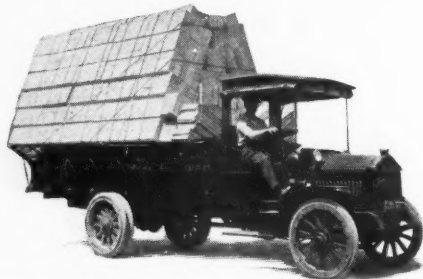
BODY DETAILS OF CARS NOT ILLUSTRATED

Barker 2-ton Stake, \$2500.

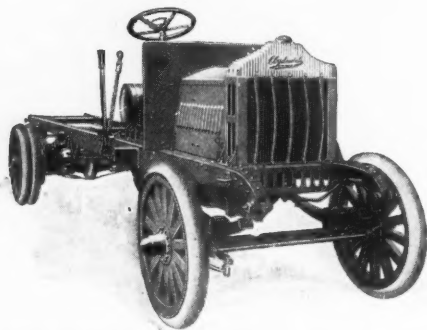
Also Flareboard, \$2500; Panel, \$2500; Screen Side Express, \$2525; Covered Flareboard, \$2525.
Burford Model O2, 2-ton Stake, \$2450.
Also Flareboard, \$2400.



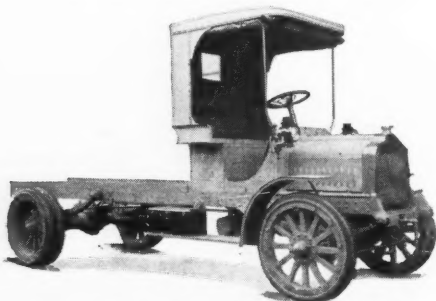
Brinton Model F, 2 1/2-ton Flareboard, Chassis, \$2250.



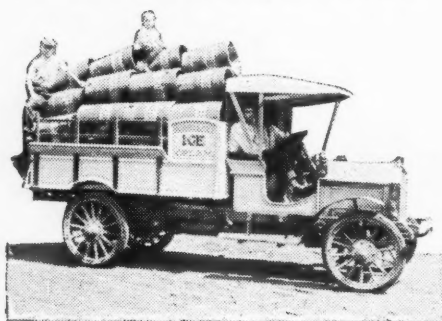
Burford Model O2, 2-ton Flareboard, \$2400. Also Stake, \$2450.



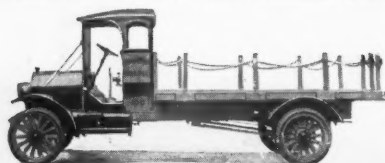
Clydesdale Model L45, 2 1/4-ton Chassis, \$2150. Made by Fulton Motor Truck Co.



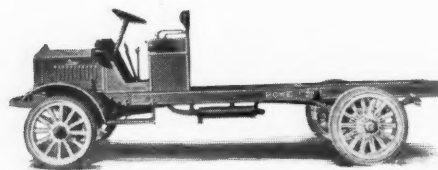
United States Model H, 2-ton Chassis



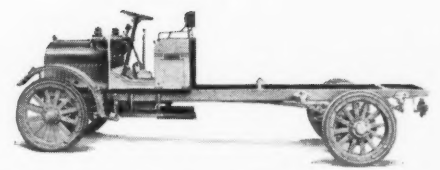
Trabold Model H, 2-ton Chassis, \$1650.



Armleder Model HW, 2-ton Stake, Chassis, \$2800.



Rowe Model CDW, 2-ton Chassis, \$2800.



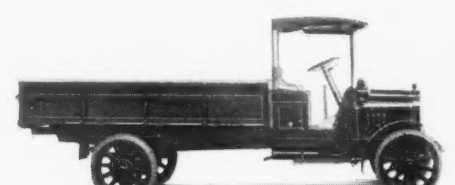
Selden Model JWL, 2-ton Chassis, \$2250.

2 Ton Gasoline

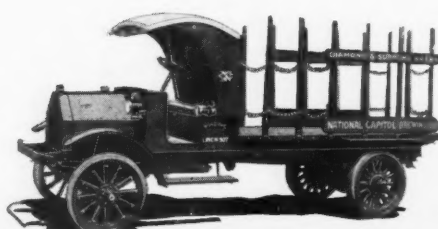
Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
K-2	4600	2250	C	28	4	4.12	5.25	B	C	V	SL	M	B
K-2	4600	2250	C	28	4	4.12	5.25	B	C	V	SL	M	B
O-2	3990	2250	B	23	4	3.75	5.5	B	C	T	Z	M	E
VM	5140	3150	D	26	4	4	5.5	B	C	C	Z	M	E
C	4500	2400	C	27	4	4.12	5.25	B	C	T	SB	M	E
H	....	2650	S	29	4	4.25	5	P	C	T	SB	M	B
E	....	2400	B	35	4	4.25	5	B	C	H	SB	M	B
70-B	4355	2300	B	29	4	4.25	5.5	B	C	T	R	M	DX
.....	4900	2300	U	23	4	3.75	5.25	B	T	V	Z	M	E
.....	5800	3000	D	27	4	4.12	5.5	B	C	T	F	M	E
.....	5800	3000	D	27	4	4.12	5.5	B	C	T	F	M	E
Mack	5100	2700	O	26	4	4	5	P	C	H	SB	M	DX
Mack	5100	2700	O	26	4	4	5	P	C	H	SB	M	DX
Mack	5000	2700	O	26	4	4	5	P	C	H	SB	M	DX
Mack	5000	2700	O	26	4	4	5	P	C	H	SB	M	DX
60	4850	2375	C	27	4	4.12	5.25	B	C	B	Z	M	B
B	5400	2450	C	27	4	4.12	5.25	B	T	H	SB	M	B
G	4950	2600	C	27	4	4.12	5.25	B	C	C	Z	M	E
G	4950	2600	C	27	4	4.12	5.25	B	C	C	Z	M	E
H	5000	2600	C	32	4	4.5	5.5	P	C	V	SB	M	B
D	4800	2350	C	27	4	4.12	5.25	B	C	V	Z	M	E
E	5000	2550	C	34	6	3.75	5.25	..	C	V	Z	M	E
.....	....	1875	C	27	4	4.12	5.5	B	..	H	SB	M	E
O	4300	1675	B	27	4	4.12	5.5	B	C	V	Z	M	B
O	4300	1675	B	27	4	4.12	5.5	B	C	V	Z	M	B
TC-2	6450	3000	O	32	4	4.5	6.5	P	W	T	SB	M	..
.....	....	3000	O	26	4	4	5.5	P	C	V	O	M	..
CBW	....	2800	..	26	4	4	5	..	C	..	P	M	B
B2	....	....	S	23	4	3.75	5	B	G	H	MS	M	B
S	4800	2100	B	29	4	4.25	5.5	B	C	T	SL	M	DX
.....	5580	2800	B	29	4	4.25	5.5	B	C	C	SL	M	B



Schacht 2-ton Flareboard, Chassis, \$2800.



Sullivan Model E, 2-ton Flareboard, Chassis, \$2250.

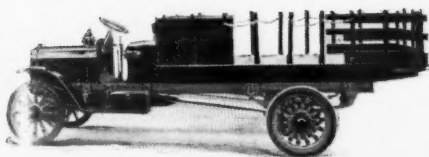


Witt-Will Model WD-2-17, 2-ton Stake, Chassis, \$2500.

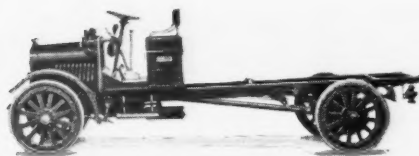


Mack Model AB, 2-ton Worm Drive Panel, Chassis, \$2700. Made by International Motor Co.

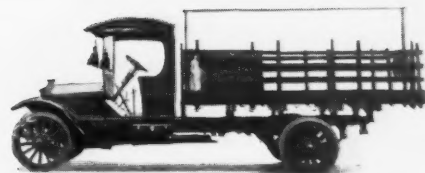
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Superior Model C, 2-ton Stake, \$1900.
Also Flareboard, \$1880.
Made by E. G. Willingham's Sons.



Selden Model JC, 2-ton Chassis, \$2000.



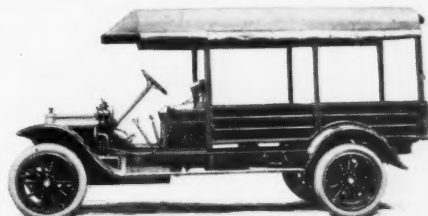
Chase Model B, 2 1/2-ton Stake, \$2625.
Also Flareboard, \$2585.

Commercial Cars

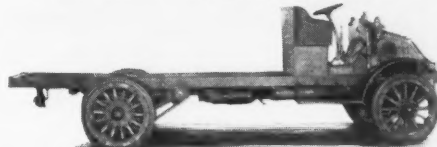
	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
	Z	C	W	Brockway Motor Truck Co., Cortland, N. Y.									
	Z	C	W	Z	3	N-T	36x4	36x7	L	C	140	..	70
				Z	3	N-T	36x4	36x3½ D	L	C	136	..	70
	F	C	I	Burford Motor Truck Co., Toledo, Ohio.									
	F	..	W	W	3	F	36x3½	36x3½ D	R	C	144	..	69
	F	D	W	Bourne Magnetic Truck Co., Philadelphia, Pa.									
	F	D	W	Z	1000	T	36x4	36x4	L	L	143	Z	80
	F	D	W	Corbitt Automobile Co., Henderson, N. C.									
	F	D	W	S	3	S	36x4	36x7	L	C	148	..	75
	F	D	C	Durable Dayton Truck Co., Dayton, Ohio.									
	F	C	W	S	3	F	36x4	36x3½ D	L	C	119	..	..
	F	D	W	Gabriel Auto Co., Cleveland, Ohio.									
	F	D	W	S	4	F	36x5*	36x6	L	C	144	..	70
	S	D	W	Garford Motor Truck Co., Lima, Ohio.									
	S	D	W	B	3	F	36x4	36x4 D	O	C	144	..	..
	S	D	W	Gramm-Bernstein Co., Lima, Ohio.									
	S	D	W	O	3	N	34x4	34x3½ D	L	C	186	WS	80
	S	D	W	Hurlburt Motor Truck Co., New York City.									
	S	D	W	S	3	S	36x4	36x4 D	L	C	148	..	80
				S	3	S	36x4	36x4 D	L	C	170	..	80
	F	D	W	International Motor Truck Co., New York City.									
	F	D	W	B	3	T	36x4	36x4 D	L	C	144	B	..
	F	D	W	B	3	T	36x4	36x4 D	L	C	162	B	..
	F	D	C	B	3	Q	36x4	36x4 D	L	C	144	B	..
	F	D	C	B	3	Q	36x4	36x4 D	L	C	162	B	..
	S	D	W	Krebs Commercial Car Co., Clyde, Ohio.									
	S	D	W	B	4	T	36x4	36x4 D	R	R	162	..	73
	S	D	C	Lange Motor Truck Co., Pittsburgh, Pa.									
	S	C	W	I	3	Q	.....	.....	.....	C	136	..	85
	S	C	W	Lippard-Stewart Motor Car Co., Buffalo, N. Y.									
	S	C	W	B	3	T	36x4	36x4 D	..	C	158	DY	70
				B	3	T	36x4	36x4 D	..	C	165	DY	70
	F	D	W	Maccar Truck Co., Scranton, Pa.									
	F	D	W	V	3	F	36x4	36x4 D	L	C	162	..	85
	S	D	W	New England Truck Co., Fitchburg, Mass.									
	S	D	W	B	3	T	36x4	36x6	L	C	144	..	70
				B	3	T	36x4	36x6	L	C	144	GD	70
	F	D	..	Niles Car & Mfg. Co., Niles, Ohio.									
	F	D	..	C	3	T	36x4	36x7	..	..	..	..	..
	F	D	I	Palmer-Moore Co., Syracuse, N. Y.									
	F	D	I	C	3	Q	34x4	34x6	L	C	140	..	70
				C	3	Q	34x4	34x6	L	C	160	..	70
	S	C	W	Peerless Motor Car Co., Cleveland, Ohio.									
	S	C	W	B	3	T	36x4	36x4 D	R	R	145	..	90
	G	C	W	Pierce-Arrow Motor Car Co., Buffalo, N. Y.									
	F	D	W	S	3	F	36x4	36x4 D	R	R	150	..	..
	F	D	W	Rowe Motor Mfg. Co., Downingtown, Pa.									
	F	D	W	S	4	..	34x4	36x3½ D	L	C	142	..	..
	F	D	W	Royal Motor Truck Co., New York City.									
	F	D	W	I	3	S	36x4	36x4 D	R	R	132	..	70
	F	D	I	Sanford Motor Truck Co., Syracuse, N. Y.									
	F	D	I	B	3	R	36x4	36x7	L	C	150	..	..
	F	C	W	G. A. Schacht Motor Truck Co., Cincinnati, Ohio.									
				O	3	O	38x4	38x4 D	L	C	144	..	75



Corbitt Model B, 2 1/2-ton Ice Body, Chassis, \$2650.
Also Stake, \$2775; Flareboard, \$2775; Panel, \$2775; Screen Side Express, \$2775; Covered Flareboard, \$2775.



White Model TBC, 2-ton Chassis, \$3000.



Kelly-Springfield Model K35, 2 1/2-ton Chassis, \$2750.
Also Stake, \$2900; Flareboard, \$2840; Panel, \$2890; Screen Side Express, \$3000; Covered Flareboard, \$2950.



Kelly-Springfield Model K36, 2 1/2-ton Chassis, \$2750.
Also Stake, \$2900; Flareboard, \$2840; Panel, \$2890; Screen Side Express, \$3000; Covered Flareboard, \$2950.



Larrabee 2 1/2-ton Flareboard, Chassis, \$2300.



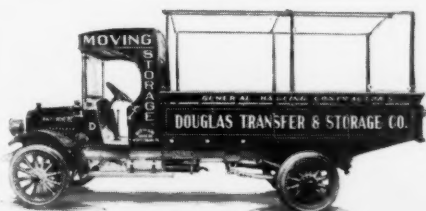
Sanford Model S, 2-ton Chassis, \$2100.
Also Flareboard, \$2250.



Pierce-Arrow 2-ton Stake, Chassis, \$2000.



Gramm-Bernstein, 2 1/2-ton Stake, \$2950.



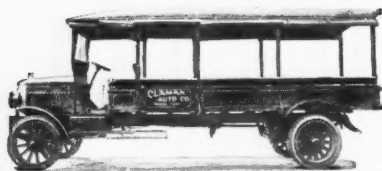
Niles 2-ton Chassis, \$1875.



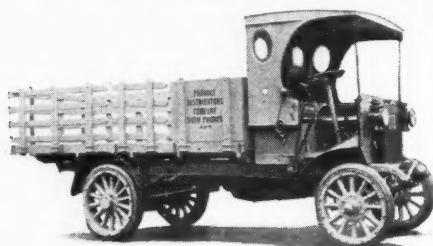
Netco Model D, 2-ton Flareboard, \$2275.
Also Stake, \$2450; Panel \$2400; Screen Side Express \$2550; Covered Flareboard, \$2550.
Made by New England Truck Co.

BODY DETAILS OF CARS NOT ILLUSTRATED
Netco Model E, 2-ton Stake, \$2650.
Also Flareboard, \$2675; Panel, \$2700; Screen Side Express, \$2750; Covered Flareboard, \$2750.
Made by New England Truck Co.

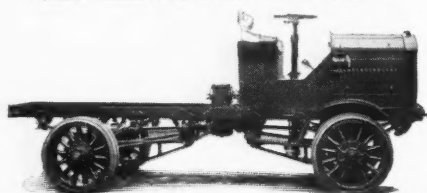
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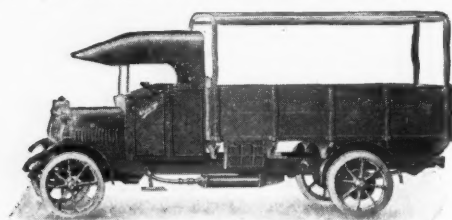
Armleder Model KW, 3 1/2-ton Covered Flareboard, Chassis, \$3500.



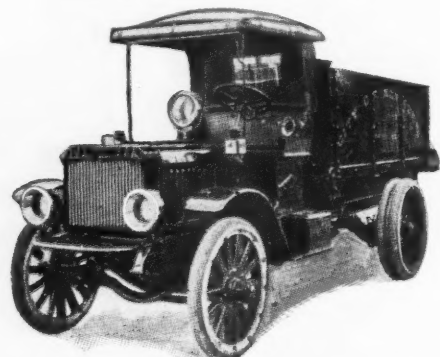
*Blair Model D, 3-ton Chassis, \$3250.



Boyd 3-ton, 4-Wheel Drive, Chassis, \$4000.



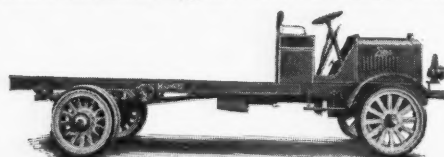
Clydesdale Model L60, 3-ton Covered Flareboard, Chassis, \$3500.
Made by Fulton Motor Truck Co.



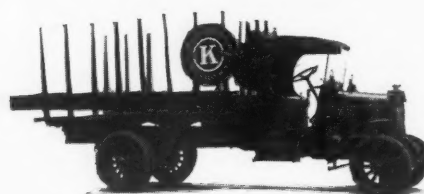
Corbitt Model A, 3 1/2-ton Stake, \$3125.
Also Flareboard, \$3125; Panel, \$3125; Screen Side Express, \$3125; Covered Flareboard, \$3125.



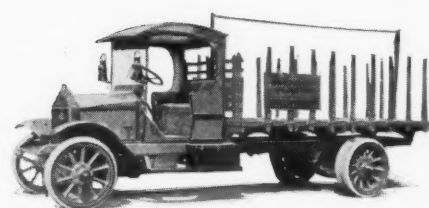
Gramm-Bernstein 3 1/2-ton Covered Stake, \$3750.



Rowe Model DEW, 3 1/2-ton Chassis, \$3400.



*Atterbury Model 7D, 3 1/2-ton Chassis, \$3375.



Chase Model O, 3 1/2-ton Stake, \$3470.
Also Flareboard, \$3435.

2 Ton Gasoline

Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
JWL	4500	2250	C	27	4	4.12	5.25	B	C	T	SB	M	B
JC	4300	2000	C	23	4	3.75	5.25	B	C	T	SB	M	B
E	4500	2250	B	27	4	4.12	5.5	B	C	V	H	M	B
H	5400	1650	..	29	4	4.25	5.5	B	W	H	SB	M	B
HW	5800	1850	..	29	4	4.25	5.5	B	W	H	SB	M	EX
H	5700	....	C	27	4	4.12	5.12	..	W	V	SB	M	B
TBC	4150	3000	O	22	4	3.75	5.12	B	C	H	O	M	E
C	....	1800	E. G. Willingham's Sons, Atlanta, Ga.	23	4	3.75	5	B	G	V	SB	M	E
WD-17	4550	2500	Witt-Willi Co., Inc., Washington, D. C.	27	4	4.12	5.25	B	C	H	Z	M	E

2 1/4 Ton Gasoline

L-45	4350	2150	Fulton Motor Truck Co., New York City.	C	23	4	3.75	5.25	B	C	T	..	M	..
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2 1/2 Ton Gasoline

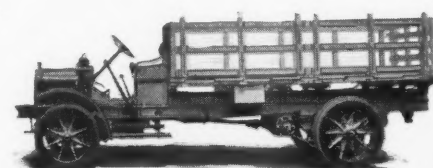
F	2250	Brinton Motor Truck Co., Philadelphia, Pa.	C	22	4	4.12	5.25	B	W	T	SB	M	B
B	5900	2475	Chase Motor Truck Co., Syracuse, N. Y.	B	27	4	4.12	5.5	B	C	T	..	M	..
B	5900	2475	..	B	27	4	4.12	5.5	B	C	T	..	M	..
B	5000	2650	Corbitt Automobile Co., Henderson, N. C.	C	27	4	4.12	5.25	B	C	T	SB	M	E
.....	5510	2700	Gramm-Bernstein Co., Lima, Ohio.	U	29	4	4.25	5.75	P	C	T	Z	M	E
K35	5300	2750	Kelly-Springfield Motor Truck Co., Springfield, Ohio.	O	23	4	3.75	5.25	B	C	C	R	M	E
K35	5300	2750	..	O	23	4	3.75	5.25	B	C	C	R	M	E
K35	5300	2750	..	O	23	4	3.75	5.25	B	C	C	R	M	E
K36	5800	2750	..	O	23	4	3.75	5.25	B	C	C	R	M	E
K36	5800	2750	..	O	23	4	3.75	5.25	B	C	C	R	M	E
.....	4700	2300	Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.	C	27	4	4.12	5.25	B	C	T	SL	M	..
.....	4700	2300	..	C	27	4	4.12	5.25	B	C	T	SL	M	..
40	4500	2700	Thomas Auto Truck Co., New York City.	B	27	4	4.12	5.5	B	C	C	P	M	B
40	4500	2700	..	B	27	4	4.12	5.5	B	C	C	P	M	B

3 Ton Gasoline

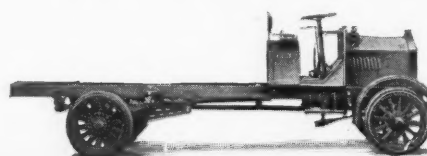
D	5750	3250	Blair Motor Truck Co., Newark, Ohio.	U	29	4	4.25	5.75	P	C	T	SL	M	B
D	5750	3250	..	U	29	4	4.25	5.75	P	C	T	SL	M	B
D	5750	3250	..	U	29	4	4.25	5.75	P	C	T	SL	M	B
4-Wheel Drive 7740	4000	4000	James Boyd & Bro., Inc., Philadelphia, Pa.	S	29	4	4.25	6	B	C	T	SB	M	B
X	....	2800	Chase Motor Truck Co., Syracuse, N. Y.	B	27	4	4.12	5.5	B	C	T	..	M	..
X	....	2800	..	B	27	4	4.12	5.5	B	C	T	..	M	..



Bessemer Model E, 3 1/2-ton Flareboard, Chassis, \$3100.
With Long Wheelbase, \$3200.



White Model TAD, 3-ton Chassis, \$3700.



Selden Model N, 3 1/2-ton Chassis, \$2950.

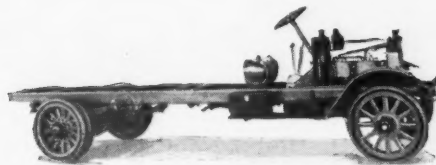


Mack Model AC, 3 1/2-ton Chain Drive Stake, Chassis, \$3400.
Made by International Motor Co.

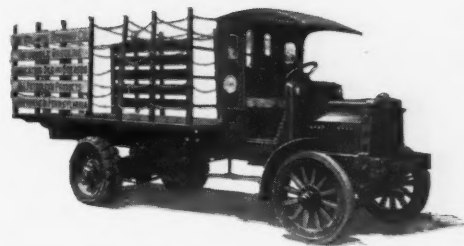
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Schacht 3-ton Chassis, \$3200.



Maccar Model N, 3 1/2-ton Chassis, \$3250.



Bourne Magnetic Model XM, 3 1/2-ton Chassis, \$3850.

Commercial Cars

Class, Drive Style	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
22	22	D	W	Selden Motor Vehicle Co., Rochester, N. Y.									
				B 3 F 36x4 36x6 L C 150 NE 67									
2	F	D	W	Sullivan Motor Truck Corp., Rochester, N. Y.									
				B 3 Q 36x4 36x6 L C 150 NE 66									
22	22	D	I	Trabold Truck Mfg. Co., Johnstown, Pa.									
				S 3 D 36x4 36x6 L C 144 .. 75									
22	22	D	W	United States Motor Truck Co., Cincinnati, Ohio.									
				S 3 F 36x4 36x6 L C 144 .. 75									
M	G	D	B	White Motor Co., Cleveland, Ohio.									
				S 4 O 34x4 36x4D O C 144									
S	F	D	I	E. G. Willingham's Sons, Atlanta, Ga.									
				F 3 B 36x4 36x6 L C 144									
..	F	D	W	Witt-Willi Co., Inc., Washington, D. C.									
				S 3 F 36x3 36x7 L C 144									

Commercial Car

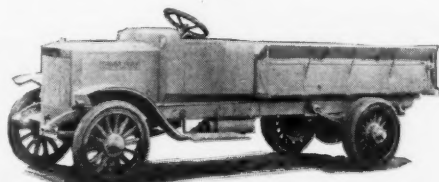
S	2	F	D	W	Fulton Motor Truck Co., New York City.	4	F	36x4	36x4D	R	R	145
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Commercial Cars

S	2	F	D	W	Brinton Motor Truck Co., Philadelphia, Pa.	3	..	36x4	36x6	L	C	138
S	2	F	D	W	Chase Motor Truck Co., Syracuse, N. Y.	3	S	36x4D	36x4D	L	C	146	..	83
S	2	F	D	W	S	3	S	36x4D	36x4D	L	C	160	..	83
S	2	F	D	W	Corbitt Automobile Co., Henderson, N. C.	3	S	36x4	36x7	L	C	148	..	75
S	2	S	D	W	Gramm-Bernstein Co., Lima, Ohio.	3	N	36x4	36x4D	L	C	156	WS	80
S	2	F	C	C	Kelly-Springfield Motor Truck Co., Springfield, Ohio.	3	Q	36x4	36x4D	L	C	144	WS	69
S	2	F	C	C	C	3	Q	36x4	36x4D	L	C	110	WS	69
S	2	F	C	C	C	3	Q	36x4	36x4D	L	C	180	WS	69
S	2	F	C	W	C	3	O	36x4	36x4D	L	C	144	WS	69
S	2	F	C	W	C	3	O	36x4	36x4D	L	C	120	WS	69
S	2	F	C	W	C	3	O	36x4	36x4D	L	C	180	WS	69
S	2	S	D	W	Larrabee-Deyo Motor Truck Co., Binghamton, N. Y.	3	N	36x4	36x6	L	C	140	GD	80
S	2	S	D	W	F	3	N	36x4	36x6	L	C	170	GD	80
S	2	S	D	W	Thomas Auto Truck Co., New York City.	3	F	34x4	34x4D	L	C	150	..	70
S	2	S	D	W	S	3	F	34x4	34x4D	L	C	168	..	70

Commercial Cars

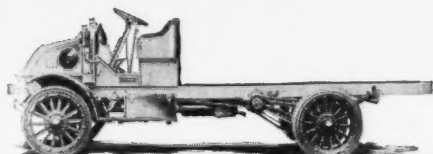
S	2	F	C	W	Blair Motor Truck Co., Newark, Ohio.	3	3/4	36x4	36x4D	R	R	121	..	73
S	2	F	C	W	I	3	3/4	36x4	36x4D	R	R	135	..	73
S	2	F	C	W	I	3	3/4	36x4	36x4D	R	R	144	..	73
S	2	F	D	W	James Boyd & Bro., Inc., Philadelphia, Pa.	3	O	40x7	40x7	L	C	129	..	60
S	2	F	D	W	Chase Motor Truck Co., Syracuse, N. Y.	3	S	36x4	36x5D	L	C	146	..	83
S	2	F	D	W	S	3	S	36x4	36x5D	L	C	160	..	83



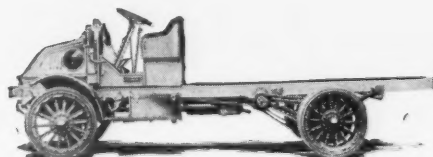
Thomas Model 40, 2 1/2-ton Flareboard, Chassis \$2700.



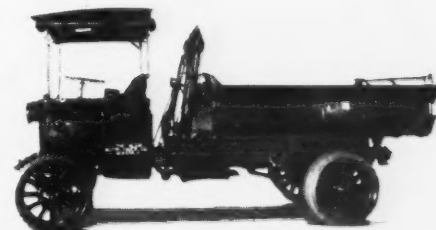
Krebs Model 90, 3 1/2-ton Chassis, \$3250.



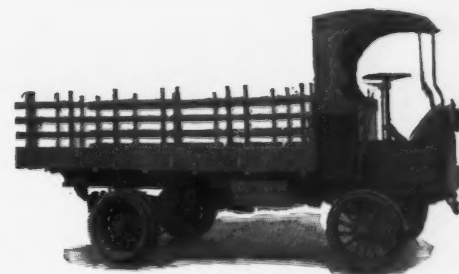
Kelly-Springfield Model K40, 3 1/2-ton Chassis, \$3400.



Kelly-Springfield Model K45, 4-ton Chassis, \$3600.



*Blair Model F, 5-ton Chassis, \$4250.



King 3 1/2-ton Stake, Chassis, \$2600.

Also Stake, \$3575; Flareboard, \$3515; Panel, \$3565; Screen Side Express, \$3675; Covered Express, \$3625.

Also Stake, \$3775; Flareboard, \$3715; Panel, \$3765; Screen Side Express, \$3875; Covered Flareboard, \$3825.

BODY DETAILS OF CARS NOT ILLUSTRATED
Clydesdale Model L90, 4 1/2-ton Chassis, \$3350.
Atterbury Model 7E, 5-ton Chassis, \$4375.

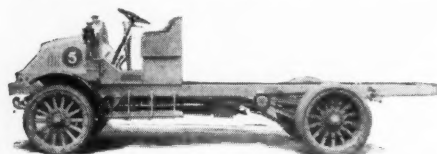
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Hurlburt 3 1/2-ton Panel, Chassis, \$3500.



Gramm-Bernstein 5-ton Slat Side Stake, \$4750.

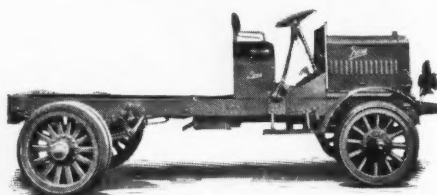
Saurer Model L, 5-ton Stake, Chassis, \$4800.
Made by International Motor Co.

Kelly-Springfield Model K50, 5-ton. Chassis, \$4250.

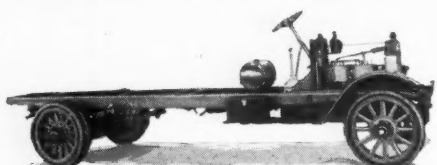
Also Stake, \$4425; Flareboard, \$4365; Panel, \$4415; Screen Side Express, \$4525; Covered Flareboard, \$4475; Hydraulic Hoist Steel Dump, \$4800.



Pierce-Arrow 5-ton Hydraulic Hoist Dump, Chassis, \$4500.



Rowe Model GW, 5-ton Chassis, \$4500.



Maccar Model U, 5 1/2-ton Chassis, \$4150.

Mack Model AC, 7 1/2-ton Chain Drive Panel, Chassis, \$4500.
Made by International Motor Co.

3 Ton Gasoline

Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
L-60	4675	2500	Fulton Motor Truck Co., New York City.	C 27	4	4.12	5.25	B C	T	..	..	M	..
B	....	3600	Locomobile Co. of America, Bridgeport, Conn.	O 29	4	4.25	6	P C	T	O	M	E	..
.....	6400	3200	G. A. Schacht Motor Truck Co., Cincinnati, Ohio.	B 29	4	4.25	5.5	B C	T	SL	M	B	..
TAD	6765	3700	White Motor Co., Cleveland, Ohio.	O 22	4	3.75	5.12	E C	H	O	M	E	..

3 1/2 Ton Gasoline

KW	6300	3500	O. Armleder Co., Cincinnati, Ohio.	C 32	4	4.5	5.5	P C	T	SL	M	B	..
KW	6300	3500		C 32	4	4.5	5.5	P C	T	SL	M	B	..
7D	6660	....	Atterbury Motor Car Co., Buffalo, N. Y.	C 32	4	4.5	5.5	P C	T	Z	M	E	..
E	6100	3100	Bessemer Motor Truck Co., Grove City, Pa.	C 32	4	4.5	5.5	P C	C	R	M	B	..
E	6100	3200		C 32	4	4.5	5.5	P C	C	R	M	B	..
R	7500	3200	Brockway Motor Truck Co., Cortland, N. Y.	C 32	4	4.5	5.5	P C	V	SL	M	B	..
XM	6000	3850	Bourne Magnetic Truck Co., Philadelphia, Pa.	D 29	4	4.25	5.5	B C	C	Z	M	E	..
O	6200	3300	Chase Motor Truck Co., Syracuse, N. Y.	E 29	4	4.25	6	B C	T	..	M	..	..
O	6200	3300		E 29	4	4.25	6	B C	T	..	M	..	..
A	7000	2900	Corbitt Automobile Co., Henderson, N. C.	C 32	4	4.5	5.5	P C	T	SB	M	E	..
K	....	3400	Durable Dayton Truck Co., Dayton, Ohio.	S 36	4	4.75	5.5	B C	T	SB	M	B	..
B	....	3400		S 29	4	4.25	6	B C	T	SB	M	B	..
77-B	7720	3400	Garford Motor Truck Co., Lima, Ohio.	S 29	4	4.25	6	B C	C	R	M	B	..
.....	6790	3400	Gramm-Bernstein Co., Lima, Ohio.	U 29	4	4.25	5.75	P C	T	Z	M	E	..
.....	6330	3500	Hurlburt Motor Truck Co., New York City.	B 29	4	4.25	5.25	B C	T	F	M	E	..
.....	6330	3500		B 29	4	4.25	5.25	B C	T	F	M	E	..
Mack	8120	3400	International Motor Truck Co., New York City.	O 40	4	5	6	P C	T	SB	M	B	..
Mack	8120	3400		O 40	4	5	6	P C	T	SB	M	B	..
Mack	8120	3400		O 40	4	5	6	P C	T	SB	M	B	..
K40	8100	3400	Kelly-Springfield Motor Truck Co., Springfield, Ohio.	O 32	4	4.5	6.5	P C	C	R	M	E	..
K40	8100	3400		O 32	4	4.5	6.5	P C	C	R	M	E	..
K40	8100	3400		O 32	4	4.5	6.5	P C	C	R	M	E	..
.....	6500	2600	A. R. King Mfg. Co., Kingston, N. Y.	C 32	4	4.5	5.5	P C	V	SL	M	B	..
A	5300	3500	Knickerbocker Motor Truck Mfg. Co., New York City.	C 32	4	4.5	5.5	P C	H	SB	M	B	..
90	6550	3250	Krebs Commercial Car Co., Clyde, Ohio.	C 32	4	4.5	5.5	P C	V	Z	M	B	..
M	6050	3250	Maccar Truck Co., Scranton, Pa.	C 32	4	4.5	5.5	P C	V	SB	M	B	..
J	7100	3200	Merchant & Evans Co., Philadelphia, Pa.	S 36	4	4.75	5.5	P C	T	Z	M	B	..
DEW	....	3400	Rowe Motor Mfg. Co., Downingtown, Pa.	.. 26	4	4	6	P C	..	P	M	B	..
.....	....	....	Royal Motor Truck Co., New York City.	S 29	4	4.25	6	B G	H	MS	M	B	..
M	6550	2950	Selden Motor Vehicle Co., Rochester, N. Y.	C 32	4	4.5	5.5	P C	T	SB	M	E	..
J	7300	....	United States Motor Truck Co., Cincinnati, Ohio.	C 32	4	4.5	5.5	.. W	T	SB	M	B	..

4 Ton Gasoline

D-3	7350	3600	Burford Motor Truck Co., Toledo, Ohio.	U 32	4	4.5	6.75	P C	T	Z	M	E	..
K45	8220	3600	Kelly-Springfield Motor Truck Co., Springfield, Ohio.	O 32	4	4.5	6.5	B C	C	R	M	E	..
K45	8220	3600		O 32	4	4.5	6.5	B C	C	R	M	E	..
K45	8220	3600		O 32	4	4.5	6.5	B C	C	R	M	E	..
B	5880	3750	Knickerbocker Motor Truck Mfg. Co., New York City.	C 32	4	4.5	5.5	B C	H	SB	M	B	..
BB	....	3750	Locomobile Co. of America, Bridgeport, Conn.	O 29	4	4.25	6	B C	T	O	M	E	..
TC-4	7100	4000	Peerless Motor Car Co., Cleveland, Ohio.	O 32	4	4.5	6.5	P W	T	SB	M	..	..

4 1/2 Ton Gasoline

L-90	6400	3350	Fulton Motor Truck Co., New York City.	C 32	4	4.5	5.5	B C	T	..	M
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5 Ton Gasoline

7E	Atterbury Motor Car Co., Buffalo, N. Y.	C 32	4	4.5	5.5	P C	T	C	M	E	..
H	8100	4000	Bessemer Motor Truck Co., Grove City, Pa.	C 32	4	4.5	5.5	P C	C	R	M	B	..
F	4250	4250	Blair Motor Truck Co., Newark, Ohio.	U 32	4	4.5	6.75	P C	T	SL	M	B	..
F	7350	4250		U 32	4	4.5	6.75	P C	T	SL	M	B	..
M	....	4500	Durable Dayton Truck Co., Dayton, Ohio.	S 44	4	5.25	7	P C	T	SB	M	B	..
6S	9330	4300	Garford Motor Truck Co., Lima, Ohio.	S 36	4	4.75	5.5	P C	C	R	M	B	..
.....	8600	4300	Gramm-Bernstein Co., Lima, Ohio.	U 32	4	4.5	6.75	P C	T	Z	M	E	..
.....	8000	4250	Hurlburt Motor Truck Co., New York City.	B 34	6	3.75	5.5	B C	T	F	M	E	..
.....	8000	4250		B 34	6	3.75	5.5	B C	T	F	M	E	..

Commercial Cars

Spark-Plug Size	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
S	F	D	W	Fulton Motor Truck Co., New York City.	S 4 F	36x4	36x4D	R R	163	..	..	..	..
S	F	C	W	Locomobile Co. of America, Bridgeport, Conn.	O 4 F	36x5	36x5D	R R	150	..	..	..	..
S	F	C	W	G. A. Schacht Motor Truck Co., Cincinnati, Ohio.	O 3 O	38x5	38x5D	L C	168	..	75	..	75
M	G	D	C	White Motor Co., Cleveland, Ohio.	S 4 O	36x5	40x5D	L C	163	..	..	..	..

Commercial Cars

S	F	B	W	O. Armleder Co., Cincinnati, Ohio.	S 3 T	36x5	36x5D	L C	156	..	..	..	..
S	F	B	W		S 3 T	36x5	36x5D	L C	186	..	..	..	..
S	F	D	W	Atterbury Motor Car Co., Buffalo, N. Y.	S 4 F	36x5	40x5D	R R	167	..	75	..	75
S	F	C	W	Bessemer Motor Truck Co., Grove City, Pa.	B 3 T	37x5	37x5D	L C	150	..	67	..	67
S	F	C	W		B 3 T	37x5	37x5D	L C	175	..	67	..	67
S	S	D	W	Brookway Motor Truck Co., Cortland, N. Y.	S 3 T	36x5	36x5D	L C	164	..	70	..	70
..	F	..	W	Bourne Magnetic Truck Co., Philadelphia, Pa.	Z 1000 T	36x5	36x5D	L L	159	Z	75	..	75
S	F	D	W	Chase Motor Truck Co., Syracuse, N. Y.	S 4 S	36x5	36x5D	L C	148	..	83	..	83
S	F	D	W		S 4 S	36x5	36x5D	L C	175	..	83	..	83
S	F	D	W	Corbitt Automobile Co., Henderson, N. C.	I 3 S	36x5	36x5D	L C	168	..	75	..	75
S	F	D	C	Durable Dayton Truck Co., Dayton, Ohio.	S 3 F	36x5	36x4D	L C	136	..	..	..	..
S	F	D	W		S 3 T	36x5	36x4D	L C	168	..	..	..	..
S	F	D	W	Garford Motor Truck Co., Lima, Ohio.	S 4 F	36x5	40x5D	R C	128	..	..	..	..
S	S	D	W	Gramm-Bernstein Co., Lima, Ohio.	O 4 N	36x5	40x5D	L C	158	WS	80	..	80
S	F	C	W	Hurlburt Motor Truck Co., New York City.	S 3 F	36x5	36x5D	L C	146	..	80	..	80
S	F	C	W		S 3 F	36x5	36x5D	L C	170	..	80	..	80
S	F	D	C	International Motor Truck Co., New York City.	O 3 Q	36x5	40x5D	L C	156	B	..	..	..
S	F	D	C		O 3 Q	36x5	40x5D	L C	168	B	..	..	..
S	F	D	C		O 3 Q	36x5	40x5D	L C	180	B	..	..	..
S	F	C	C	Kelly-Springfield Motor Truck Co., Springfield, Ohio.	C 3 T	38x5	38x5D	L C	150	WS	71	..	71
S	F	C	C		C 3 T	38x5	38x5D	L C	116	WS	71	..	71
S	F	C	C		C 3 T	38x5	38x5D	L C	208	WS	71	..	71
S	F	D	C	A. R. King Mfg. Co., Kingston, N. Y.	A 3 O	36x5	36x5D	R R	120	..	70	..	70
..	S	C	C	Knickerbocker Motor Truck Mfg. Co., New York City.	A 3 T	36x5	36x5D	L L	124	..	70	..	70
S	S	D	W	Krebs Commercial Car Co., Clyde, Ohio.	B 4 T	36x5	36x5D	R R	180	..	78	..	78
S	F	D	W	Maccar Truck Co., Scranton, Pa.	B 3 F	36x5	36x5D	L C	174	..	85	..	85
S	S	D	W	Merchant & Evans Co., Philadelphia, Pa.	S 3 S	..	..	R R	156	..	65	..	65
..	F	D	W	Rowe Motor Mfg. Co., Downingtown, Pa.	S 4 ..	36x5	36x5D	L C	156	..	..	..	..
S	F	D	W	Royal Motor Truck Co., New York City.	I 2 F	36x5	36x5D	R R	158	..	70	..	70
S	S	D	W	Selden Motor Vehicle Co., Rochester, N. Y.	B 2 F	36x5	36x5D	R C	164	NE	90	..	90
..	F	C	W	United States Motor Truck Co., Cincinnati, Ohio.	S 3 N	36x5	40x5D	O C	..	..	..	..	..

Commercial Cars

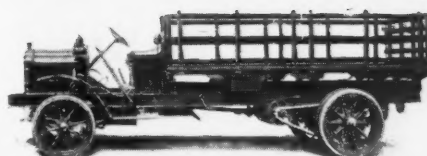
..	F	C	W	Burford Motor Truck Co., Toledo, Ohio.	B 3 S	38x5	38x5D	R R	175	..	60	..	60
S	F	C	C	Kelly-Springfield Motor Truck Co., Springfield, Ohio.	C 3 T	38x5	40x6D	L C	150	WS	73	..	73
S	F	C	C		C 3 T	38x5	40x6D	L C	116	WS	73	..	73
..	S	C	C		C 3 T	38x5	40x6D	L C	208	WS	73	..	73
S	F	C	W	Knickerbocker Motor Truck Mfg. Co., New York City.	A 3 T	36x5	36x5D	L L	132	..	70	..	70
S	F	C	W	Locomobile Co. of America, Bridgeport, Conn.	O 4 F	36x5	36x6D	R R	150	..	..	..	..
M	S	C	C	Peerless Motor Car Co., Cleveland, Ohio.	O 4 Q	36x5	40x5D	R R	151	..	92	..	92

Commercial Car

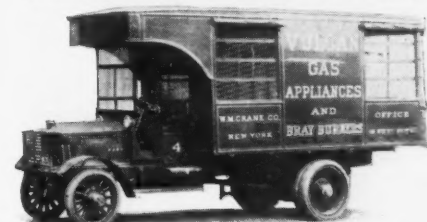
S	F	D	W	Fulton Motor Truck Co., New York City.	S 4 F	R R	180
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Commercial Cars

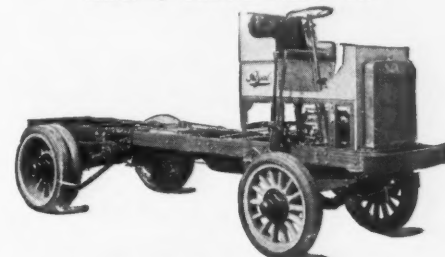
S	F	D	W	Atterbury Motor Car Co., Buffalo, N. Y.	S 4 F	36x5	40x6D	R R	167	..	75	..	75
S	F	C	W	Bessemer Motor Truck Co., Grove City, Pa.	B 3 T	36x6	37x6D	L C	150	..	67	..	67
S	F	C	W	Blair Motor Truck Co., Newark, Ohio.	I 3 3/4	36x6	36x6D	R R	135	..	74	..	74
S	F	C	W		I 3 3/4	36x6	36x6D	R R	144	..	74	..	74
S	F	D	C	Durable Dayton Truck Co., Dayton, Ohio.	S 3 F	36x6	42x5D	L C	148	..	..	..	..
S	F	D	C	Garford Motor Truck Co., Lima, Ohio.	S 4 Q	36x5	40x5D	R R	128	..	..	..	..
S	S	C	W	Gramm-Bernstein Co., Lima, Ohio.	O 4 N	36x6	40x6D	L C	168	WS	80	..	80
S	F	D	W	Hurlburt Motor Truck Co., New York City.	S 3 F	36x5	38x6D	L C	156	..	80	..	80
S	F	D	W		S 3 F	36x5	38x6D	L C	170	..	80	..	80



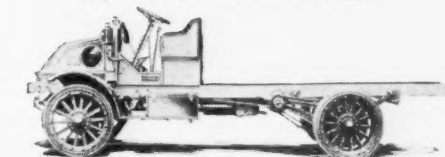
White Model TCD, 5-ton Chassis, \$4500.



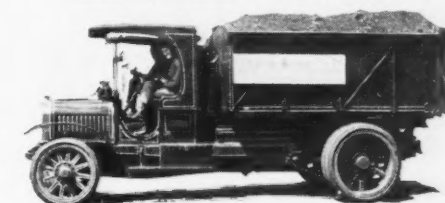
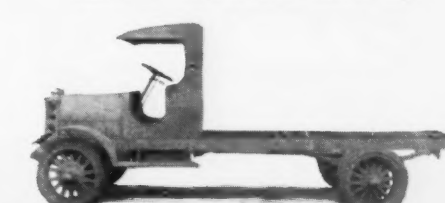
Hurlburt 7-ton Special Covered Body, Chassis, \$5000.

G. V. Mercedes Model FE, 6-ton Special Body, Chassis, \$4500.
Made by General Vehicle Co.

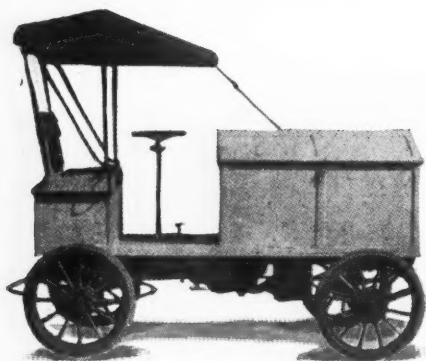
Royal Model A5, 5-ton Chassis.



Kelly-Springfield Model K60, 6-ton. Chassis, \$4500.

Mack Model AC, 5 1/2-ton Chain Drive, Special Body, Chassis, \$5000.
Made by International Motor Co.Saurer Model M, 6 1/2-ton Power Dump, Chassis, \$5800.
Made by International Motor Co.

Merchant & Evans 3 1/2-ton Chassis, \$3200.



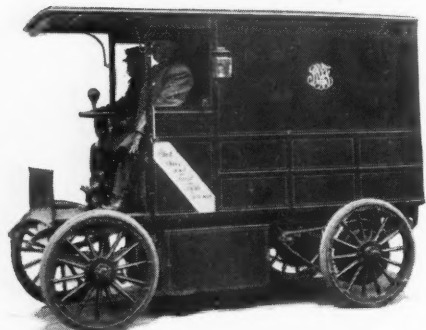
Volta Car Model A, 500-lb. Box Body, Chassis, \$650.

Also Open Flareboard, \$725; Panel \$800.
Made by Cyco-Lectric Car Co.



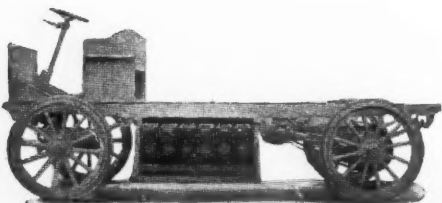
CT, 1000-lb. Panel, \$2225.

Also Stake, \$2125; Screen Side Express, \$2125;
Covered Flareboard, \$2150.
Made by Commercial Truck Co. of America.



GV, 1000-lb. Chain Drive Panel, \$2115.

Also Open Flareboard, \$1940; Screen Side Express, \$2115; Covered Flareboard, \$1990.
Made by General Vehicle Co., Inc.



Lansden Model N, 1-ton Chassis, \$2900.

5 Ton Gasoline

Model	Chassis Weight	Chassis Price	Engine Make	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled	Radiator	Carburetor	Ignition Type	Ignition Make
Saurer L	6090	4800	International Motor Truck Co., New York City.										
			O	31	4	4.37	5.5	P	C	C	O	M	B
K50	8480	4250	Kelly-Springfield Motor Truck Co., Springfield, Ohio.										
			O	32	4	4.5	6.5	B	C	C	R	M	E
K50	8480	4250	O	32	4	4.5	6.5	B	C	C	R	M	E
K50	8480	4250	O	32	4	4.5	6.5	B	C	C	R	M	E
C	6200	4500	Knickerbocker Motor Truck Mfg. Co., New York City.										
			C	32	4	4.5	5.5	B	C	H	SB	M	B
98	7200	4000	Krebs Commercial Car Co., Clyde, Ohio.										
			C	32	4	4.5	5.5	P	C	V	Z	M	B
98	7200	4000	C	32	4	4.5	5.5	P	C	V	Z	M	B
TC-5	8550	4500	Peerless Motor Car Co., Cleveland, Ohio.										
			O	32	4	4.5	6.5	P	W	T	SB	M	..
.....	....	4500	Pierce-Arrow Motor Car Co., Buffalo, N. Y.										
			O	38	4	4.87	6	P	C	V	O	M	..
GW	....	4500	Rowe Motor Mfg. Co., Downingtown, Pa.										
			..	36	4	4.75	5.5	P	C	..	P	M	B
.....	....	....	Royal Motor Truck Co., New York City.										
			S	36	4	4.75	5.5	P	G	H	MS	M	B
.....	....	....	S	36	4	4.75	5.5	P	G	H	MS	M	B
K	8500	....	United States Motor Truck Co., Cincinnati, Ohio.										
			C	32	4	4.5	5.5	..	W	T	SB	M	B
.....	8000	4000	Walter Motor Truck Co., New York City.										
			O	31	4	4.37	6	B	G	T	HN	M	E
TCB	8000	4500	White Motor Co., Cleveland, Ohio.										
			O	28	4	4.25	6.37	B	C	H	O	M	E

5½ Ton Gasoline

International Motor Truck Co., New York City.													
Mack	8700	4000	O	40	4	5	6	P	C	T	SB	M	B
Mack	8700	4000	O	40	4	5	6	P	C	T	SB	M	B
Mack	8700	4000	O	40	4	5	6	P	C	T	SB	M	B
U	7050	4150	Maccar Truck Co., Scranton, Pa.										
			C	32	4	4.5	5.5	P	C	V	SB	M	B

6 Ton Gasoline

69	9245	4500	Garford Motor Truck Co., Lima, Ohio.										
			S	41	4	5.10	5.5	P	C	C	R	M	B
FE	7400	4500	General Vehicle Co., Long Island City, N. Y.										
			O	29	4	4.25	5.9	P	C	C	..	M	B
.....	8800	4500	Gramm-Bernstein Co., Lima, Ohio.										
			U	32	4	4.5	6.75	P	C	T	Z	M	E
Saurer N	7000	5800	International Motor Truck Co., New York City.										
			O	31	4	4.37	5.5	P	C	C	O	M	B
K60	8760	4500	Kelly-Springfield Motor Truck Co., Springfield, Ohio.										
			O	32	4	4.5	6.5	P	C	C	R	M	E
K60	8760	4500	O	32	4	4.5	6.5	P	C	C	R	M	E
K60	8760	4500	O	32	4	4.5	6.5	P	C	C	R	M	E
.....	....	....	Royal Motor Truck Co., New York City.										
			S	42	4	5.12	6	P	G	H	MS	M	B
.....	....	....	S	42	4	5.12	6	P	G	H	MS	M	B
.....	8500	4200	Walter Motor Truck Co., New York City.										
			G	31	4	4.37	6	B	G	T	HN	M	E

7 Ton Gasoline

Hurlburt Motor Truck Co., New York City.													
.....	10100	5000	B	34	6	3.75	5.5	B	C	T	F	M	E
.....	10100	5000	B	34	6	3.75	5.5	B	C	T	F	M	E
.....	....	....	Royal Motor Truck Co., New York City.										
			S	44	4	5.25	7	P	G	H	MS	M	B
.....	....	....	S	44	4	5.25	7	P	G	H	MS	M	B

7½ Ton Gasoline

E	....	4950	Durable Dayton Truck Co., Dayton, Ohio.										
			S	44	4	5.25	7	P	C	T	SB	M	B
Mack	9100	4500	International Motor Truck Co., New York City.										
			O	40	4	5	6	P	C	T	SB	M	B
Mack	9100	4500	O	40	4	5	6	P	C	T	SB	M	B
Mack	9100	4500	O	40	4	5	6	P	C	T	SB	M	B
.....	9000	4500	Walter Motor Truck Co., New York City.										
			O	31	4	4.37	6	B	G	T	HN	M	E

Gasoline Tractors

.....	3400	850	Lovelace Engineering Co., Inc., New Brunswick, N. J.										
			O	66	4	5	7	S	W	T	D	M	..
L	5500	2750	Merchant & Evans Co., Philadelphia, Pa.										
			S	29	4	4.25	5	P	C	T	Z	M	B
.....	6670	....	Watson Wagon Co., Canastota, N. Y.										
			C	32	4	4.5	5.5	P	C	H	Z	M	B

FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE

Commercial Cars

Modeling Size	Lubrication	Clutch	Drive	Transmission	Speeds Forward	Rear Axles	Front Tires	Rear Tires	Driver's Seat	Brake and Gear Lever Location	Wheelbase	Engine Starter	% Total Weight on Rear Wheels
70/70	S	C	C	International Motor Truck Co., New York City.									
				O	4	O	36x5	42x5D	R	R	153	..	83
	F	C	C	Kelly-Springfield Motor Truck Co., Springfield, Ohio.									
				C	3	T	38x6	40x6D	L	C	150	WS	75
70/6	F	C	C										
				C	3	T	38x6	40x6D	L	C	116	WS	75
				C	3	T	38x6	40x6D	L	C	208	WS	75
70/6	S	C	C	Knickerbocker Motor Truck Mfg. Co., New York City.									
				A	3	T	36x6	36x6D	L	L	148	..	70
70/6	S	D	W	Krebs Commercial Car Co., Clyde, Ohio.									
				B	4	T	36x6	40x6D	R	R	160	..	80
	S	D	W	B	4	T	36x6	40x6D	R	R	180	..	80
70/6	S	C	C	Peerless Motor Car Co., Cleveland, Ohio.									
				O	4	Q	38x6	42x6D	R	R	151	..	92
70/6	G	C	W	Pierce-Arrow Motor Car Co., Buffalo, N. Y.									
				S	3	F	36x5	40x6D	R	R	168	..	..
70/6	F	D	W	Rowe Motor Mfg. Co., Downingtown, Pa.									
				S	4	..	36x6	40x6D	L	C	171	..	..
70/6	F	D	W	Royal Motor Truck Co., New York City.									
				I	3	F	36x6	40x6D	R	R	158	..	70
	F	D	W	I	3	F	36x6	40x6D	R	R	168	..	70
70/6	F	C	W	United States Motor Truck Co., Cincinnati, Ohio.									
				S	3	N	36x5	40x6D	O	C	174	..	..
70/6	F	C	I	Walter Motor Truck Co., New York City.									
				S	4	Q	36x6	40x5D	L	C	168	..	..
70/6	G	D	C	White Motor Co., Cleveland, Ohio.									
				S	4	O	36x5	40x6D	L	C	169	..	..



CT, 1-ton Covered Flareboard, \$2580.

Also Stake, \$2555; Panel, \$2655; Screen Side Express, \$2605.

Made by Commercial Truck Co. of America.



GV 1-ton Panel, \$2595.

Also Open Flareboard, \$2420; Screen Side Express, \$2595; Covered Flareboard, \$2470.

Made by General Vehicle Co., Inc.

Commercial Cars

70/6	F	D	C	International Motor Truck Co., New York City.									
				O	3	Q	36x6	40x6D	L	C	156	B	..
	F	D	C	O	3	Q	36x6	40x6D	L	C	168	B	..
	F	D	C	O	3	Q	36x6	40x6D	L	C	180	B	..
70/6	F	D	W	Maccarr Truck Co., Scranton, Pa.									
				B	4	F	36x6	36x6D	L	C	186	..	85

Commercial Cars

70/6	F	D	C	Garford Motor Truck Co., Lima, Ohio.									
				S	4	Q	36x6	40x5D	R	R	128	..	..
70/6	F	C	I	General Vehicle Co., Long Island City, N. Y.									
				O	4	O	34x5	40x6D	R	R	169	..	82
70/6	S	D	W	Gramm-Bernstein Co., Lima, Ohio.									
				O	4	N	36x6	40x7D	L	C	168	WS	80
70/6	S	C	C	International Motor Truck Co., New York City.									
				O	4	O	36x5	42x5D	R	R	156	..	88
70/6	F	C	C	Kelly-Springfield Motor Truck Co., Springfield, Ohio.									
				C	3	T	38x6	40x7D	L	C	150	WS	77
	F	C	C	C	3	T	38x6	40x7D	L	C	116	WS	77
	F	C	C	C	3	T	38x6	40x7D	L	C	208	WS	77
70/6	F	D	C	Royal Motor Truck Co., New York City.									
				I	3	Q	36x6	40x6D	R	R	138	..	60
	F	D	C	I	3	Q	36x6	40x6D	R	R	158	..	70
70/6	F	C	I	Walter Motor Truck Co., New York City.									
				S	4	Q	36x6	40x6D	L	C	168	..	..

Commercial Cars

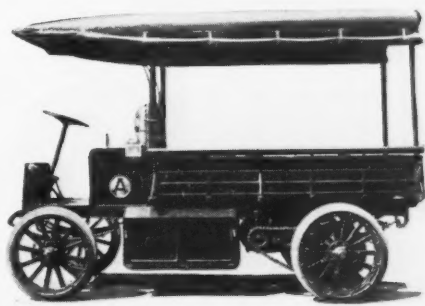
70/6	F	D	W	Hurlburt Motor Truck Co., New York City.									
				S	4	S	36x6	40x7D	L	C	156	..	80
	F	D	W	S	4	S	36x6	40x7D	L	C	170	..	80
70/6	F	D	C	Royal Motor Truck Co., New York City.									
				I	3	Q	36x7	40x7D	R	R	138	..	60
	F	D	C	I	3	Q	36x7	40x7D	R	R	158	..	70

Commercial Cars

70/6	F	D	C	Durable Dayton Truck Co., Dayton, Ohio.									
				S	3	F	36x7	42x6D	L	C	148	..	..
70/6	F	D	C	International Motor Truck Co., New York City.									
				O	3	Q	36x7	40x7D	L	C	156	B	..
	F	D	C	O	3	Q	36x7	40x7D	L	C	168	B	..
	F	D	C	O	3	Q	36x7	40x7D	L	C	180	B	..
70/6	F	C	I	Walter Motor Truck Co., New York City.									
				S	4	Q	36x6	40x7D	L	C	168	..	..

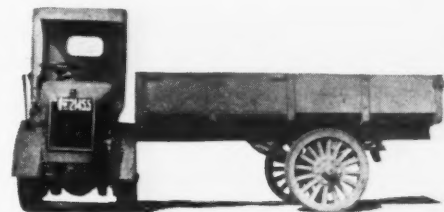
Gasoline Tractors

70/6	F	D	W	Lovelace Engineering Co., Inc., New Brunswick, N. J.									
				P	2	F	4	.....	R	R	80	AR	..
70/6	S	D	C	Merchant & Evans Co., Philadelphia, Pa.									
				S	3	Q	.....	.....	R	R	118	..	75
70/6	S	D	W	Watson Wagon Co., Canestoga, N. Y.									
				B	4	T	34x4	36x5D	R	C	80	..	..



Atlantic Model IC, 1-ton Covered Flareboard, \$2655.

Also Open Flareboard, \$2590; Panel, \$2665; Screen Side Express, \$2680.



Merchant & Evans Model L Tractor, \$2750.

BODY DETAILS OF CARS NOT ILLUSTRATED

Volta Car Model B, 500-lb. Chassis, \$700.

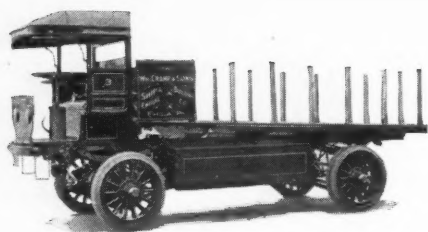
Also Open Flareboard, \$775; Panel, \$850.

Made by Cyco-Lectric Car Co.

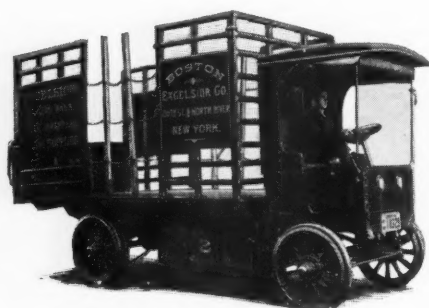
GV, 1000-lb. Worm Drive Panel, \$2425.

Also Open Flareboard, \$2250; Screen Side Express, \$2425; Covered Flareboard, \$2300.

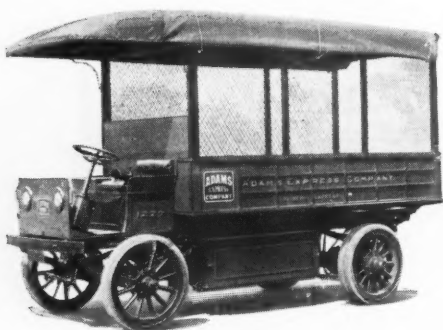
Made by General Vehicle Co., Inc.



CT 3 1/2-ton Stake, \$4260.
Also Panel, \$4410; Screen Side Express, \$4325;
Covered Flareboard, \$4310.
Made by Commercial Truck Co. of America.



Atlantic Model 2C, 2-ton Stake, \$3215.
Also Open Flareboard, \$3225; Panel, \$3300;
Screen Side Express, \$3300; Covered Flareboard,
\$3290.



CT 2-ton Screen Side Express, \$3200.
Also Stake, \$2135; Panel, \$3275; Covered Flare-
board, \$3175.
Made by Commercial Truck Co. of America.



GV 2-ton Stake, \$2880.
Also Open Flareboard, \$2950; Panel, \$3200;
Screen Side Express, \$3150; Covered Flareboard,
\$3025.
Made by General Vehicle Co., Inc.

1 1/4 Ton Steam

S. C.	Model	Weight	Chassis Price	Horse Power	Cylinders	Bore	Stroke	Final Drive
828		3500	1900	16	2	4.5	6.5	SP

Stanley Motor Carriage Co., Newton, Mass.

2 1/2 Ton Steam

A		4650	3000	..	2	4	5	SP
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American Machine Co., Newark, Del.

500 Pound Electric

E. C.	Model	Weight	Chassis Price	Maximum Speed	Battery	Mileage per Charge	Motor	Controller	Speeds Forward
A		1100	650	15	GL	65	GE	GE	4
B		1100	650	15	GL	65	GE	GE	4

Cyco-Letric Car Co., New York City.

750 Pound Electric

.....		1500	1850	15	ED	60	GE	GE	4
Ward Special		1400	....	12	ED	45	WS	WS	4

Lansden Co., Inc., Brooklyn, N. Y.

Ward Motor Vehicle Co., Mt. Vernon, N. Y.

1000 Pound Electric

.....		1800	1925	13	OP	60	GE	O	4
.....		2375	2250*	12	O	65	GE	GE	5
.....		2065	1940*	12	O	50	GE	GE	5
.....		2000	2310	14	ED	60	GE	GE	4

Commercial Truck Co. of America, Philadelphia, Pa.

General Vehicle Co., Inc., Long Island City, N. Y.

Lansden Co., Inc., Brooklyn, N. Y.

1500 Pound Electric

WB		3250	10	ED	4
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Ward Motor Vehicle Co., Mt. Vernon, N. Y.

1 Ton Electric

IC		4530	2400	12	E	50	GE	GE	4
.....		2500	2330	12	OP	60	GE	O	4
.....		2950	2420*	10	O	55	GE	GE	5
.....		2700	2900	15	ED	50	GE	GE	4

Atlantic Electric Vehicle Co., Newark, N. J.

Commercial Truck Co. of America, Philadelphia, Pa.

General Vehicle Co., Inc., Long Island City, N. Y.

Lansden Co., Inc., Brooklyn, N. Y.

1 1/2 Ton Electric

WD		4250	8 1/2	ED	4
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Ward Motor Vehicle Co., Mt. Vernon, N. Y.

2 Ton Electric

2C		5900	3000	11	E	45	GE	GE	4
.....		3500	2850	10	OP	55	GE	O	4
.....		4050	2880*	9	O	55	GE	GE	5
.....		4400	3660	10	ED	50	GE	GE	4

Atlantic Electric Vehicle Co., Newark, N. J.

Commercial Truck Co. of America, Philadelphia, Pa.

General Vehicle Co., Inc., Long Island City, N. Y.

Lansden Co., Inc., Brooklyn, N. Y.

3 Ton Electric

WF		6000	7	ED	4
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Ward Motor Vehicle Co., Mt. Vernon, N. Y.

3 1/2 Ton Electric

3-C		8000	3650	10	E	45	GE	GE	4
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Atlantic Electric Vehicle Co., Newark, N. J.

FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE

Commercial Car

Rear Axle	Front Tires	Rear Tires	Rims	Steering Gear	Driver's Seat	Wheelbase
O	36x5*	Stanley Motor Carriage Co., Newton, Mass. 36x5*	S	..	L	136

Commercial Car

B	34x4	American Machine Co., Newark, Del. 36x4D	S	..	L	144
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Commercial Cars

Front Drive	Rear Axle	Front Tires	Rear Tires	Rims	Steering Gear	Driver's Seat	Wheelbase	% Total Weight on Rear Wheels
C ₃	CL	.....	.....	E	W	..	68	65
C	CL	.....	.....	E	W	..	68	65
Cyco-Letric Car Co., New York City.								

Commercial Cars

B	T	36x2½	36x2½	..	O	O	90	..
Lansden Co., Inc., Brooklyn, N. Y.								
B	T	32x2½	32x2½	..	..	O	88	..
Ward Motor Vehicle Co., Mt. Vernon, N. Y.								

Commercial Cars

CT	O	36x3	36x3	E	W	L	O	60
Commercial Truck Co. of America, Philadelphia, Pa.								
W	F	36x3	36x3	..	W	L	108	60
C	Q	36x2½	36x2½	..	O	L	89	60
General Vehicle Co., Inc., Long Island City, N. Y.								
B	T	36x2½	36x3	..	W	O	96	..
Lansden Co., Inc., Brooklyn, N. Y.								

Commercial Car

W	..	34x3½	36x4	..	..	..	102	..
Ward Motor Vehicle Co., Mt. Vernon, N. Y.								

Commercial Cars

C	T	34x3½	36x4	E	W	L	103	80
Atlantic Electric Vehicle Co., Newark, N. J.								
CT	T	36x3½	36x4	E	W	L	100	60
Commercial Truck Co. of America, Philadelphia, Pa.								
C	Q	36x3½	36x3½	..	O	L	104	60
General Vehicle Co., Inc., Long Island City, N. Y.								
D	T	36x3	36x3½	..	W	O	106	..
Lansden Co., Inc., Brooklyn, N. Y.								

Commercial Car

W	..	36x4	38x6	..	..	..	114	..
Ward Motor Vehicle Co., Mt. Vernon, N. Y.								

Commercial Cars

C	T	34x4	36x3D	E	W	L	115	80
Atlantic Electric Vehicle Co., Newark, N. J.								
CT	O	36x5	36x3½D	E	W	L	116	60
Commercial Truck Co. of America, Philadelphia, Pa.								
C	Q	36x4	36x3D	..	O	L	112	60
General Vehicle Co., Inc., Long Island City, N. Y.								
D	T	36x4	36x4D	..	W	O	120	..
Lansden Co., Inc., Brooklyn, N. Y.								

Commercial Car

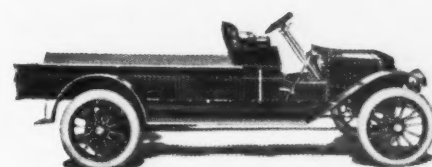
W	..	38x6	40x8	..	..	..	132	..
Ward Motor Vehicle Co., Mt. Vernon, N. Y.								

Commercial Car

C	T	36x5	40x4D	E	W	L	135	75
Atlantic Electric Vehicle Co., Newark, N. J.								



Atlantic Model 3C, 3½-ton Stake, \$3900.
Also Open Flareboard, \$3900; Panel, \$3975;
Screen Side Express, \$3995; Covered Flareboard,
\$3975.



Stanley Model 828, Open Flareboard, \$2100.



G. V. 3½-ton Stake, \$3595, Without Hood.
Also Open Flareboard, \$3660, Panel, \$3910;
Screen Side Express, \$3860; Covered Flareboard,
\$3735.
Made by General Vehicle Co., Inc.



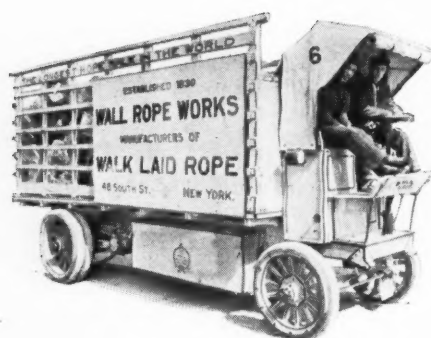
Lansden 3½-ton Chassis, \$4555.

BODY DETAILS OF CARS NOT ILLUSTRATED

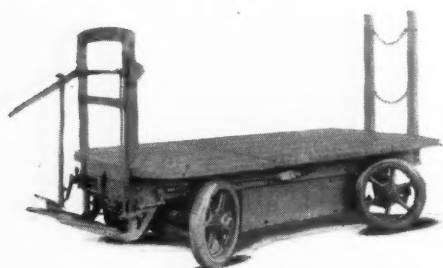
Titan Model A, Chassis, \$3000.
Made by American Machine Co.

Lansden 2-ton Chassis, \$3660.

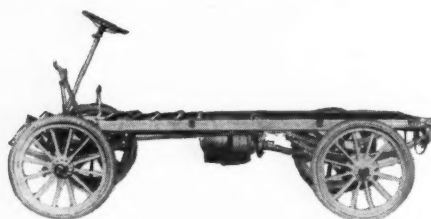
FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE



Atlantic Model 5C, 5-ton Stake, \$4575.
Also Open Flareboard, \$4555; Panel, \$4640;
Screen Side Express, \$4655; Covered Flareboard,
\$4640.



Crescent Type F, Industrial Truck.
Made by Samuel L. Moore & Sons Corp.



Ward Special 750-lb. Chassis.

3½ Ton Electric

Model	Weight	Chassis Price	Maximum Speed	Battery	Mileage per Charge	Motor	Controller	Speeds Forward
-------	--------	---------------	---------------	---------	--------------------	-------	------------	----------------

Commercial Truck Co. of America, Philadelphia, Pa.

.....	5000	3910	9	OP	50	GE	O	4
-------	------	------	---	----	----	----	---	---

General Vehicle Co., Inc., Long Island City, N. Y.

.....	6200	3660*	8	O	50	GE	GE	5
-------	------	-------	---	---	----	----	----	---

Lansden Co., Inc., Brooklyn, N. Y.

.....	8100	4455	8	ED	50	GE	GE	4
-------	------	------	---	----	----	----	----	---

5 Ton Electric

Atlantic Electric Vehicle Co., Newark, N. J.

5-C	9500	4275	9	E	45	GE	GE	4
-----	------	------	---	---	----	----	----	---

Commercial Truck Co. of America, Philadelphia, Pa.

.....	6000	4425	7	OP	50	GE	O	4
-------	------	------	---	----	----	----	---	---

General Vehicle Co., Inc., Long Island City, N. Y.

.....	6500	4060*	7	O	45	GE	GE	5
-------	------	-------	---	---	----	----	----	---

Lansden Co., Inc., Brooklyn, N. Y.

.....	10000	5190	7	ED	50	GE	GE	4
-------	-------	------	---	----	----	----	----	---

Ward Motor Vehicle Co., Mt. Vernon, N. Y.

WH	8000	6	ED	4
----	------	------	---	----	----	----	----	---

Electric Tractors

Samuel L. Moore & Sons Corp., Elizabeth, N. J.

F	2100	7	OP	B	.
---	------	------	---	----	----	----	---	---

Alphabetical Index of Commercial Car Manufacturers—Buyers' Reference Review

GASOLINE COMMERCIAL CARS

Maker	Page	Maker	Page
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O. Armleder Co.	26, 32	A. R. King Mfg. Co.	32
Autocar Co.	26	Knickerbocker Motor Truck Co.	32, 34
Atterbury Motor Car Co.	22, 24, 26, 32	H. J. Koehler Motors Corp.	22
C. L. Barker	22, 26	Krebs Commercial Car Co.	26, 28, 32, 34
Bell Motor Car Co.	20	Lange Motor Truck Co.	22, 28
Bessemer Motor Truck Co.	22, 26, 32	Larrabee-Deyo Motor Truck Co.	22, 26, 30
Blair Motor Truck Co.	26, 30, 32	Lippard-Stewart Motor Car Co.	20, 22, 24, 26, 28
Bourne Magnetic Truck Co.	28, 32	Locomobile Co. of America	32
James Boyd & Bro., Inc.	30	Maccar Truck Co.	24, 28, 32, 34
Brinton Motor Truck Co.	20, 30	Martin Carriage Works	22
Brockway Motor Truck Co.	22, 24, 28, 32	Merchant & Evans Co.	32
Burford Motor Truck Co.	28, 32	Metz Co.	20
Champion Wagon Co., Inc.	20	New England Truck Co.	28
Chase Motor Truck Co.	22, 24, 30, 32	Niles Car & Mfg. Co.	24, 28
Collier Motor Truck Co.	20	Palmer-Moore Co.	24, 28
Commercial Truck Co.	22	Peerless Motor Car Co.	28, 32, 34
Corbitt Automobile Co.	20, 22, 24, 28, 30, 32	Pennsy Motors Co. of Pittsburgh	20
Cortland Cart & Carriage Co.	20	Pierce-Arrow Motor Car Co.	28, 34
Croce Automobile Co.	20	Pullman Motor Car Co.	20
Day-Elder Motors Co.	20, 22, 24	Rainier Motor Corp.	20
Denneen Motor Co.	24	Rowe Motor Mfg. Co.	28, 32, 34
Durable Dayton Truck Co.	28, 32, 34	Royal Motor Truck Co.	24, 28, 32, 34
Fulton Motor Truck Co.	24, 30, 32	Rush Motor Truck Co.	20
Gabriel Auto Co.	22, 24, 28	Sanford Motor Truck Co.	22, 24, 28
Garford Motor Truck Co.	22, 26, 28, 32, 34	G. A. Schacht Motor Truck Co.	26, 28, 32
General Vehicle Co.	34	Selden Motor Vehicle Co.	22, 24, 30, 32
Gramm-Bernstein Co.	22, 26, 28, 30, 32	Stewart Motor Corp.	22, 24, 26
Hoover Wagon Co.	22	Sullivan Motor Truck Corp.	26, 30
Hurlburt Motor Truck Co.	26, 28, 32, 34	Tegetmeier & Riepe Co.	26
International Motor Co.	22, 26, 28, 32, 34	Thomas Auto Truck Co.	30
Kearns Motor Truck Co.	20	Trabold Truck Mfg. Co.	24, 30
Kelly-Springfield Motor Truck Co.	26, 30, 32, 34	United States Motor Truck Co.	30, 32, 34
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General Vehicle Co., Inc.	36, 38
Lansden Co., Inc.	36, 38
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Stanley Motor Carriage Co.	36

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Commercial Cars

Final Drive	Rear Axle	Front Tires	Rear Tires	Rims	Steering Gear	Driver's Seat	Wheelbase	% Total Weight on Rear Wheels
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Commercial Truck Co. of America, Philadelphia, Pa.

I	O	36x3½D	36x4D	E	W	L	115	55
---	---	--------	-------	---	---	---	-----	----

General Vehicle Co., Inc., Long Island City, N. Y.

C	Q	36x6	36x4D	..	O	L	132	60
---	---	------	-------	----	---	---	-----	----

Lansden Co., Inc., Brooklyn, N. Y.

D	T	36x5	36x4D	..	W	O	130	..
---	---	------	-------	----	---	---	-----	----

Commercial Cars

Atlantic Electric Vehicle Co., Newark, N. J.

C	T	36x6	40x5D	E	W	L	144	75
---	---	------	-------	---	---	---	-----	----

Commercial Truck Co. of America, Philadelphia, Pa.

I	O	36x4D	36x5D	E	W	L	132	55
---	---	-------	-------	---	---	---	-----	----

General Vehicle Co., Inc., Long Island City, N. Y.

C	Q	36x7	36x5D	..	O	L	142	60
---	---	------	-------	----	---	---	-----	----

Lansden Co., Inc., Brooklyn, N. Y.

D	T	36x6	36x5D	..	W	O	142	..
---	---	------	-------	----	---	---	-----	----

Ward Motor Vehicle Co., Mt. Vernon, N. Y.

W	..	40x8	42x10	..	O	..	144	..
---	----	------	-------	----	---	----	-----	----

Electric Tractors

Samuel L. Moore & Sons Corp., Elizabeth, N. J.

W	..	20x3½	20x3½	..	L	..	68	..
---	----	-------	-------	----	---	----	----	----



Walker Model N, 5-ton Special Body.



CT 5-ton Stake, \$4800.

Also Panel, \$4950; Screen Side Express, \$4875;
Covered Flareboard, \$4850.
Made by Commercial Truck Co. of America.



GV 5-ton Stake, \$4060.

Also Open Flareboard, \$4130; Panel, \$4405;
Screen Side Express, \$4355; Covered Flareboard,
\$4230.

Made by General Vehicle Co., Inc.

BODY DETAILS OF CARS NOT ILLUSTRATED
Lansden 5-ton Chassis, \$5190.

Gasoline and Electric Commercial Cars Indexed According to Chassis Price

500 Pound Commercial Cars.

Price Cyl. H.P.	Maker	Page
500 4 24	Metz Co.	20
650 Electric.	Cyclo-Lectric Car Co.	36

750 Pound Commercial Cars.

Price Cyl. H.P.	Maker	Page
625* 4 18	Willys-Overland Co.	20
1850 Electric.	Lansden Co., Inc.	36

1000 Pound Commercial Cars.

Price Cyl. H.P.	Maker	Page
625 4 17	Kearns Motor Truck Co.	20
645 4 14	Vim Motor Truck Co.	20
680 4 16	Pennys Motors Co. of Pittsburgh	20
695 4 17	Rush Motor Truck Co.	20
750* 4 23	Pullman Motor Car Co.	20
775* 4 23	Pullman Motor Car Co.	20
800* 4 23	Cortland Cart & Carriage Co.	20
825* 4 20	Bell Motor Car Co.	20
835 4 17	Croce Automobile Co.	20
875* 4 20	Bell Motor Car Co.	20
875 4 17	Rainier Motor Corp.	20
1000 4 17	Lippard-Stewart Motor Car Co.	20
1925 Electric.	Commercial Truck Co. of America	36
1940 Electric.	General Vehicle Co., Inc.	36
2250 Electric.	General Vehicle Co., Inc.	36
2310 Electric.	Lansden Co., Inc.	36

1200 Pound Commercial Cars.

Price Cyl. H.P.	Maker	Page
775* 4 27	Willys-Overland Co.	20
825 4 17	Kentucky Wagon Mfg. Co.	20

1500 Pound Commercial Cars.

Price Cyl. H.P.	Maker	Page
750 4 17	Martin Carriage Works	22
795 4 14	Stewart Motor Corp.	22
800 4 17	Collier Motor Truck Co.	20
875 4 17	Champion Wagon Co., Inc.	20
895 4 16	Day-Elder Motors Co.	20
950 4 17	Brinton Motor Truck Co.	20
985 4 16	Selden Motor Vehicle Co.	22
1100 4 20	Corbitt Automobile Co.	20
1190 4 23	Hoover Wagon Co.	22
1290 4 20	Sanford Motor Truck Co.	22
1500 4 23	Lippard-Stewart Motor Car Co.	22
1600 4 23	Lippard-Stewart Motor Car Co.	22
2100 4 22	White Motor Co.	22

1 Ton Commercial Cars.

Price Cyl. H.P.	Maker	Page
895 4 20	H. J. Koehler Motor Corp.	22
950 4 20	Trabold Truck Mfg. Co.	24
975 4 20	Bessemer Motor Truck Co.	22
1050 4 20	Trabold Truck Mfg. Co.	24
1075 4 20	Palmer-Moore Co.	24
1175 4 20	Niles Car & Mfg. Co.	24
1300 4 22	Corbitt Automobile Co.	22
1350 4 20	E. G. Willingham's Sons	24
1370 4 20	Sanford Motor Truck Co.	24
1390 4 20	Stewart Motor Corp.	24
1450 4 20	Brockway Motor Truck Co.	22
1450 4 20	Day-Elder Motors Co.	22
1450 4 20	Garford Motor Truck Co.	22
1475 4 20	Brockway Motor Truck Co.	22
1500 4 18	Commercial Truck Co.	22
1550 4 23	Larrabee-Deyo Motor Truck Co.	22
1600 4 30	Gabriel Auto Co.	22
1625 4 18	Commercial Truck Co.	22
1650 4 20	Chase Motor Truck Co.	22
1650 4 23	Gramm-Bernstein Co.	22

Price Cyl. H.P.	Maker	Page
1700 4 20	Selden Motor Vehicle Co.	24
1850 4 23	Witt-Will Co., Inc.	24
1850 4 27	Lange Motor Truck Co.	22
1875 4 22	Atterbury Motor Car Co.	22
2000 4 26	C. L. Barker	22
2000 4 26	International Motor Co.	22
2000 4 23	Lippard-Stewart Motor Car Co.	24
2100 4 27	Maccar Truck Co.	24
2330 Electric.	Commercial Truck Co. of America	36
2400 Electric.	Atlantic Electric Vehicle Co.	36
2420 Electric.	General Vehicle Co., Inc.	36
2900 Electric.	Lansden Co., Inc.	36

1¼ Ton Commercial Cars.

Price Cyl. H.P.	Maker	Page
1050 4 20	Fulton Motor Truck Co.	24
1385 4 23	Denneen Motor Co.	24
1455 4 23	Denneen Motor Co.	24
3500 Steam.	Stanley Motor Carriage Co.	36

1½ Ton Commercial Cars.

Price Cyl. H.P.	Maker	Page
1900 4 23	Fulton Motor Truck Co.	24
1200 4 20	Fulton Motor Truck Co.	24
1485 4 20	Stewart Motor Corp.	26
1600 4 27	Sullivan Motor Truck Corp.	26
1800 4 23	Day-Elder Motors Co.	24
1800 4 23	Garford Motor Truck Co.	26
1825 4 23	Brockway Motor Truck Co.	24
1850 4 23	Brockway Motor Truck Co.	24
1950 4 20	Chase Motor Truck Co.	24
2000 4 35	Gabriel Auto Co.	24
2000 4 23	Gramm-Bernstein Co.	26
2000 4 23	Kelly-Springfield Motor Truck Co.	26

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Gasoline and Electric Commercial Cars Indexed According to Chassis Price (Continued From Page 39)

Price	Cyl.	H.P.	Maker	Page
2000	4	27	Larrabee-Deyo Motor Truck Co.	26
2050	4	27	Krebs Commercial Car Co.	26
2075	4	22	Atterbury Motor Car Co.	24
2150	4	23	Corbitt Automobile Co.	24
2200	4	27	Tegetmeier & Riepe Co.	26
2250	4	23	Hurlburt Motor Truck Co.	26
2300	4	27	Lippard-Stewart Motor Car Co.	26
2350	4	26	International Motor Co.	26
2650	4	29	G. A. Schacht Motor Truck Co.	26

2 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
1650	2	18	Autocar Co.	26
1650	4	29	Trabold Truck Mfg. Co.	30
1675	4	27	Palmer-Moore Co.	28
1800	4	23	E. G. Willingham's Sons	30
1850	4	29	Trabold Truck Mfg. Co.	30
1875	4	27	Niles Car & Mfg. Co.	28
2000	4	23	Selden Motor Vehicle Co.	30
2100	4	29	Sanford Motor Truck Co.	28
2125	4	28	Brockway Motor Truck Co.	28
2150	4	28	Brockway Motor Truck Co.	28
2200	4	27	Bessemer Motor Truck Co.	26
2250	4	27	Bessemer Motor Truck Co.	26
2250	4	23	Burford Motor Truck Co.	28
2250	4	27	Selden Motor Vehicle Co.	30
2250	4	27	Sullivan Motor Truck Corp.	30
2300	4	29	Garford Motor Truck Co.	28
2300	4	23	Gramm-Bernstein Co.	28
2350	4	27	New England Truck Co.	28
2375	4	27	Krebs Commercial Car Co.	28
2400	4	26	C. L. Barker	26
2400	4	27	Corbitt Automobile Co.	28
2400	4	35	Gabriel Auto Co.	28
2450	4	27	Lange Motor Truck Co.	28
2500	4	27	Witt-Will Co., Inc.	30
2550	6	34	New England Truck Co.	28
2575	4	27	Atterbury Motor Car Co.	26
2600	4	27	Lippard-Stewart Motor Car Co.	26
2600	4	32	Maccar Truck Co.	28
2650	4	29	Durable-Dayton Truck Co.	28
2700	4	26	International Motor Co.	28
2800	4	36	American Motor Truck Co.	26
2800	4	27	O. Armleder Co.	26
2800	4	26	Rowe Motor Mfg. Co.	28
2800	4	29	G. A. Schacht Motor Truck Co.	28
2850	4	29	Blair Motor Truck Co.	26
2850	Electric		Commercial Truck Co. of America	36
2880	Electric		General Vehicle Co., Inc.	36
3000	Electric		Atlantic Electric Vehicle Co.	36
3000	4	27	Hurlburt Motor Truck Co.	28
3000	4	32	Peerless Motor Car Co.	28
3000	4	26	Pierce-Arrow Motor Car Co.	28
3000	4	22	White Motor Co.	30
3150	4	26	Bourne Magnetic Truck Co.	28
3660	Electric		Lansden Co., Inc.	36

2 1/4 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
2150	4	23	Fulton Motor Truck Co.	30

2 1/2 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
2250	4	22	Brinton Motor Truck Co.	30
2300	4	27	Larrabee-Deyo Motor Truck Co.	30
2475	4	27	Chase Motor Truck Co.	30
2650	4	27	Corbitt Automobile Co.	30
2700	4	29	Gramm-Bernstein Co.	30
2700	4	27	Thomas Auto Truck Co.	30
2750	4	23	Kelly-Springfield Motor Truck Co.	30
3000	Steam.		American Machine Co.	36

3 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
2500	4	27	Fulton Motor Truck Co.	32
2600	4	29	Locomobile Co. of America	32
2800	4	27	Chase Motor Truck Co.	30
3200	4	29	G. A. Schacht Motor Truck Co.	32
3250	4	29	Blair Motor Truck Co.	30
3700	4	22	White Motor Co.	32
4000	4	29	James Boyd & Bro., Inc.	30

3 1/2 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
2600	4	32	A. R. King Mfg. Co.	32
2900	4	32	Corbitt Automobile Co.	32
2950	4	32	Selden Motor Vehicle Co.	32
3100	4	32	Bessemer Motor Truck Co.	32
3200	4	32	Bessemer Motor Truck Co.	32
3200	4	36	Merchant & Evans Co.	32
3250	4	32	Krebs Commercial Car Co.	32
3250	4	32	Maccar Truck Co.	32
3300	4	29	Chase Motor Truck Co.	32
3400	4	29	Durable Dayton Truck Co.	32
3400	4	36	Durable Dayton Truck Co.	32
3400	4	29	Garford Motor Truck Co.	32
3400	4	29	Gramm-Bernstein Co.	32
3400	4	40	International Motor Co.	32
3400	4	32	Kelly-Springfield Motor Truck Co.	32
3400	4	26	Rowe Motor Mfg. Co.	32
3500	4	32	O. Armleder Co.	32
3500	4	29	Hurlburt Motor Truck Co.	32
3500	4	32	Knickerbocker Motor Truck Mfg. Co.	32
3650	Electric		Atlantic Electric Vehicle Co.	36
3660	Electric		General Vehicle Co., Inc.	38
3850	4	29	Bourne Magnetic Truck Co.	32
3910	Electric		Commercial Truck Co. of America	38
4455	Electric		Lansden Co., Inc.	38

4 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
3600	4	32	Burford Motor Truck Co.	32
3600	4	32	Kelly-Springfield Motor Truck Co.	32
3750	4	32	Knickerbocker Motor Truck Mfg. Co.	32
3750	4	29	Locomobile Co. of America	32
4000	4	32	Peerless Motor Car Co.	32

4 1/2 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
3350	4	32	Fulton Motor Truck Co.	32

5 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
4000	4	32	Bessemer Motor Truck Co.	32
4000	4	32	Krebs Commercial Car Co.	34
4000	4	28	White Motor Co.	34
4060	Electric		General Vehicle Co., Inc.	38
4250	4	32	Blair Motor Truck Co.	32
4250	6	34	Hurlburt Motor Truck Co.	32
4250	4	32	Kelly-Springfield Motor Truck Co.	34
4275	Electric		Atlantic Electric Vehicle Co.	38
4300	4	36	Garford Motor Truck Co.	32
4300	4	32	Gramm-Bernstein Co.	32
4425	Electric		Commercial Truck Co. of America	38
4500	4	44	Durable Dayton Truck Co.	32
4500	4	32	Knickerbocker Motor Truck Co.	34
4500	4	32	Peerless Motor Car Co.	34
4500	4	36	Rowe Motor Mfg. Co.	34
4800	4	31	International Motor Co.	34
5190	Electric		Lansden Co., Inc.	38

5 1/2 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
4000	4	40	International Motor Co.	34
4150	4	32	Maccar Truck Co.	34

6 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
4200	4	31	Walter Motor Truck Co.	34
4500	4	41	Garford Motor Truck Co.	34
4500	4	29	General Vehicle Co.	34
4500	4	32	Gramm-Bernstein Co.	34
4500	4	32	Kelly-Springfield Motor Truck Co.	34
5800	4	31	International Motor Co.	34

7 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
5000	6	34	Hurlburt Motor Truck Co.	34

7 1/2 Ton Commercial Cars.				
Price	Cyl.	H.P.	Maker	Page
4500	4	40	International Motor Co.	34
4500	4	31	Walter Motor Truck Co.	34
4950	4	44	Durable Dayton Truck Co.	34

TRACTORS

Gasoline Tractors.

Price	Cyl.	H.P.	Maker	Page
850	4	66	Lovell Engineering Co.	34
2750	4	29	Merchant & Evans Co.	34

FIRST HALF OF REVIEW. LAST HALF WILL BE IN THE FEBRUARY ISSUE

HOW A TRUCK MAY BE BOUGHT ON TIME

By GEORGE W. GRUPP

One reason why some of our business men hesitate in replacing their horse-driven vehicles for motor trucks is because of the great outlay of cash in one payment. Some dealers have tried to meet this demand by selling their trucks on a part payment plan. But for various reasons some of these plans proved to be unsatisfactory to both parties. As a result, both dealers and prospective buyers hesitate. For this reason the Guaranty Securities Corp., of New York City, are now attempting to bring their pleasure car "Guaranty Plan of Time Payments" experience into play in the truck market. Their plan is unique and it may prove to be of some value to prospective buyer, dealer or capitalist.

The Guaranty Securities Corp. does not sell trucks, it merely arranges for their

purchase through co-operating dealers. And so far as the writer knows, they do not limit or influence the buyer's selection of a truck. The only thing they insist upon is a small initial payment which must be at least 25 per cent. of the cost of the chassis, body, freight and guaranty charges. The trade-in is considered as part of the 25 per cent. initial payment. As soon as the contract and agreement of delivery of truck is signed, the various forms of insurance go into effect. The dealer always determines whether collision insurance is advisable. The dealer keeps all of the initial payment, and he then forwards the contract and notes to the Guaranty Corp., who in turn send to him a 10 per cent. "deferred certificate" of the face of the note, on which they pay the dealer interest. The buyer pays the balance in monthly installments over a period of 12 months. The difference in price between list price and the part-payment

plan, such as just described, is merely an additional small sum which covers the Guaranty charges and 6 per cent. interest.

HIGHWAY TRACTOR COMPANY INCORPORATED

Highway Tractor Co., Indianapolis, Ind., capitalized at \$2,000,000, was incorporated by Carl G. Fisher, James A. Allison and Henry F. Campbell. The company will manufacture tractors with 10-ton drawing power. A new plant of concrete and steel construction will be erected near the Indianapolis Motor Speedway, and when completed will afford employment for 300 men. Charles G. McCutchen, former president of the Ross Automobile Co., will be president of the Highway Co., and Mr. Fisher will be secretary-treasurer. A. E. Schaaf will be factory manager. The price of the machine will be approximately \$1250.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

Republic Dispatch Completes Trip From Alma, Mich., to Los Angeles

Mud in Iowa and Missouri, Snow in Montana and High Passes of Rockies and Sierras Traversed by New Fifteen Hundred Pound Model in Four Thousand Mile Trip With Only One Day's Delay for Repair

THE "Republic Dispatch," the new 1500-lb. maximum capacity Republic truck driven from the factory at Alma, Mich., to the Pacific Coast by H. L. Dewey and Lester Poyer, arrived at its destination, the store of D. F. Poyer, Republic distributor in Los Angeles, on December 14. It completed in good condition a trip of 4080 miles, including the greatest variety of trying road conditions imaginable. One day's delay for repairs, an average of 15.3 miles to the gallon of gasoline, the average in California being 17.3 miles, and 62 miles to the quart of oil is the summary of its record. The route followed covered portions of the Lincoln Highway, Santa Fe Trail and Midland Trail transcontinental routes.

The Republic Dispatch started from Alma October 5. Bad roads began in heavy clay between Peoria and Springfield, Ill. In Iowa rains made the Lincoln Highway a continuous clay quagmire that clogged the wheels with a solid cake of mud. A day of 60 to 70 miles was good traveling through the wet clay and gumbo of Missouri and Iowa to Des Moines. But continuous progress put these difficulties be-

hind, and good roads were encountered to Kansas City. Striking the Santa Fe trail near Emporia, the Republic Dispatch had good roads and made 200 to 250 miles a day to Pueblo, Col., and from there tore off the 117 miles on the magnificent state highway into Denver in 5½ hours.

Going into the Rockies beyond Denver the previous experience with rough roads was surpassed in every day's travel. It was a continuous succession of climbs upward through gigantic passes, with clay, rocks, snow, streams to be forded, narrow trails winding along the rock walls of deep canyons, dangerous as well as difficult. It was a tryout such as few trucks will ever be called upon to equal. In Wyoming the snow was in drifts so deep that shoveling

had to be resorted to frequently. In the mountainous country beyond Rock Springs a slight clutch trouble showed up, necessitating a day spent on a repair due to a little defect in a casting. More heavy grades followed, terminating in a 15-mile downward coast to Salt Lake City.

The Lincoln Highway was followed from Salt Lake City to Ely, Nev. Three great

Camping in the Mountains

This is the camping place among the Currant Creek Mountains, about sixty miles south of Ely, Nevada.



The Republic in Wyoming

This is a sample of the snowdrifts in the mountain-surrounded prairies of Wyoming, which made many days a siege of hard pulling and shoveling. View is of the country near Green River, Wyoming.

mountain passes were negotiated before getting into Ely, at which point the Midland Trail was taken up, leading through Tonopah to California. Westgard Pass, 8500 ft., rivaled the difficulties of the famous Shesbourn Pass, which had been crossed north-east of Ely. Going over Tehachepi Pass the Republic soon found itself going into Bakersfield on the beautiful asphalt surface of the California state highway system, the best roads encountered on the entire trip.

The Republic Dispatch which made the trip is the new Model 9, 1500 lbs. capacity. Its load of supplies, baggage, camping equipment and crew was 3900 lbs. The tires were Goodrich pneumatic, 32 x 4 in. all around. The rear tires were badly rock-cut in Missouri, and new ones were put on

as a precaution at Kansas City and came through in fine condition. One tire stood the strain of the entire run. A Master carburetor was used, giving efficient operation at high altitudes and the fuel economy indicated by the average of 15.3 miles to the gallon, in a trip of extraordinary mud conditions and long heavy grades.

In the western mountains and desert country Dewey and Poyer noted trucks in successful operation in numerous isolated districts many miles from the railroad. Ranchers and mining men are learning that the day of the horse is past. Daily mileage and ability to carry its own fuel have caused the motor to supersede the "hay-burner" as fast as its reliability has been recognized.

CHAIN-DRIVE DESIGN

[505] Would it be efficient and satisfactory to drive from a sprocket on a transmission which is being suspended to a sprocket on a jackshaft which is rigid, the movement of the driving sprocket being up to 1 in. up and down, and the distance between centers of sprockets being 7 in.? Sprockets are twenty-one tooth. Chain ¾ in. wide, ⅝ in. pitch. Chain can be adjusted.

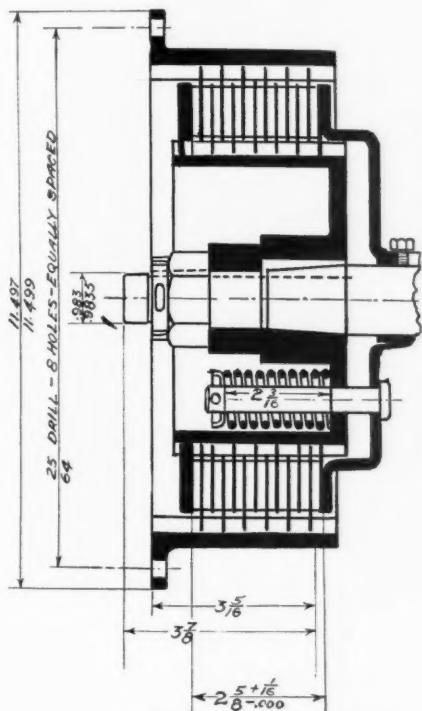
If above conditions are not correct at what distance between should the sprocket be placed? What would be the minimum? The engine used is 15 h.p.—C. M. Marsh, Glens Falls, N. Y.

ANSWER.

The arrangement you propose is quite a common one and all right. The length of the chain is not of much matter. Of course you understand that the longer the chain is the less the spring motion will affect the drive. But the spring movement you propose is not large, so the amount of jerk transmitted to the car or engine will be small. You can easily hold one sprocket firmly and by moving the other as if compressing the spring you can see it partly revolve. The movement is very slight, however, and not to be compared with the movement found if gears are used which mesh with each other. The application of power tends to lift or depress the spring supported sprocket, but this too is much less than with gears.—C. E. D.

Merit wins—that's why the CCJ is the leader

The "CF" transmission is furnished with a disc clutch only, but the "D" transmission is furnished with either a cone clutch or a disc clutch. In the general arrangement a cone clutch is shown, while the Detroit standard twelve plate disc clutch is illustrated separately. The driving discs are of cold rolled steel, to which two discs of Raybestos have been riveted, one on each side. The driven members, which are gripped between the Raybestos surfaces when the clutch is engaged, consist of saw steel discs that have been ground on both surfaces. A distinctive feature about this clutch is that both the teeth on the inside of the driving ring, which engage the driving discs, and the teeth on the outside of the driven spider, which engage the driven discs, are gear teeth which are cut on standard gear shapers. The advantage of this arrangement is that the power is transmitted uniformly all around these circumferences, and the amount of the driving surface is so great that any danger of failure of the discs is done away with. Any necessity for adjustment, due to the wear of the discs, has been eliminated by the use of the special springs, which give approximately a constant pressure through the whole range of possible wear of discs.



Sectional View of Disc Clutch
This is the Model G Disc Clutch. It has twelve fiber discs

The clutch thrust bearing is lubricated through a hole down the center of the main drive gear, which is connected to the bearing by a small radial hole. The emergency brake lever is attached to the side of the gear box. The clutch pedal and the service brake pedal are mounted on the shaft which passes through the bell housing.

LINE DRIVE TRACTOR Co., recently organized in Pierre, S. D., will establish a plant in South Milwaukee, Wis.

THE MASTER CARBURETOR IN COMMERCIAL CAR SERVICE

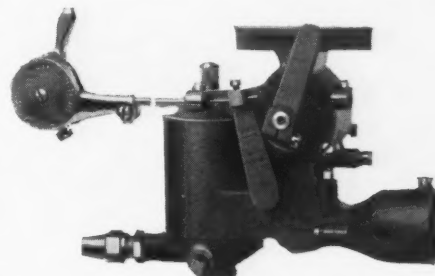
Among the classes of service to which the Master carburetor, manufactured by the Master Carburetor Corp., Detroit, Mich., is said to be particularly adapted, is that of the motor truck. In fact, some twenty makes of commercial cars of all sizes are fitted with it as standard equipment. In the latest model announced some slight mechanical changes have been made which add to its efficiency, ease of operation and control. The most important of these is the replacing of the brass needle in the float chamber with one of monel metal, which, being much harder than brass, is less susceptible to wear at the needle point.

Another change in the float chamber compartment is the use of a steel stamping to hold the float weights, that is, a separate piece from the top and screws in place instead of the integral brackets heretofore used. This allows a more positive action of the float weight mechanism due to more accurate positioning, and at the same time the steel stamping is given the added function of locking the float chamber in place. In previous models the cap was held on by a spring wire that fitted into a slot in the inner side of the float chamber above the cap, but the new way is to have two arms extending out from the steel float-weight bracket, these registering with two slots in the float chamber walls, and when the cap is turned horizontally, the arms engage grooves in the walls and an effective lock, free from any up-and-down movement, is obtained.

Due to the low grade fuel now available, the semi-hot air type of carburetor, air intake, has been abandoned, and an intake requiring all hot air is supplied. This air is drawn from a stove that is fitted to the exhaust manifold and connected by a flexible tube. However, a simpler means of obtaining a supply of cold air, when desired, has been worked out. Around the end of the air pipe adjoining the carburetor are bored several holes that are normally closed by the end of the flexible tube that connects with the hot-air stove. To open them it is only necessary to pull the end of the flexible tube out far enough to clear these holes, which secures a mixed air supply. In previous Masters a rather elaborate damper was employed for this same purpose.

The Master principle of vaporization employs a mechanical means of breaking up the fuel. The instrument is a multi-jet affair, there being anywhere from 14 to 21 tiny jets, the exact number depending upon the size of the carburetor. The distributor carrying the jets is placed across the air intake, and a rotary throttle is arranged with openings so that more and more of the little jets are uncovered and made operative as the throttle control is opened to supply the demand for more power.

At the side of the distributor block is an air damper arranged so that it will admit more or less air, as needed. This damper is controlled by a lever on the steering column under the wheel. Thus the amount of air, and hence the richness of the mix-



The Latest Master Carburetor

This is the latest type, the improved method of regulating hot and cold air admittance being clearly shown.

the mixture to aid in starting. And none of the driver's time is wasted in priming the engine.

Specially to be noticed is that the carburetor permits of no adjusting, or rather, tampering, by the truck driver. Once the proper size of carburetor and correct jet block is fitted, it is impossible to do any adjusting other than controlling the air by the air lever already mentioned. Thus the device is substantially fool-proof, an asset where truck drivers are wont to tamper with the adjustments.

Master carburetors for trucks and light commercial cars are supplied in sizes to suit any engine. Where the original equipment of the engine is not adaptable to the installation of the Master, special manifolds are supplied, so that even the oldest engines can be successfully equipped. The prices range from \$15 to \$62.50, and the sizes from $\frac{3}{4}$ in. to $2\frac{1}{2}$ in.

CHANGES IN PERSONNEL OF COVERT GEAR COMPANY

B. V. Covert, founder of the Covert Gear Co., Inc., Lockport, N. Y., has retired from the presidency and has been succeeded by P. A. Clum, treasurer. Mr. Clum has had active charge of the executive end of the business since its inception and, by purchasing practically all of Mr. Covert's common stock holdings, assumes the office of president in addition to that of treasurer. Mr. Covert, however, still retains a substantial financial interest in the company. F. E. Mosher has become general manager and A. A. Gloetzner, sales manager, the latter filling the vacancy caused by the resignation of Gould Allen, at the Detroit sales office. Mr. Gloetzner has also become chief engineer.

Make your product pay—advertise in the CCJ

NEW QUICK-DETACHABLE TRUCK-CONVERTING UNIT

The Ton-A-Ford Truck Co., of Racine, Wis., has brought out a new extension or converting unit for Ford cars, the feature of which is its detachability. The maker claims that this unit is the only one which, after it has been attached to a Ford chassis, can be easily and quickly detached, leaving the Ford chassis intact but for the removal of the rear wheels.

This convertibility has been made possible through the fact that the Ford rear axle and frame is kept intact when attach-

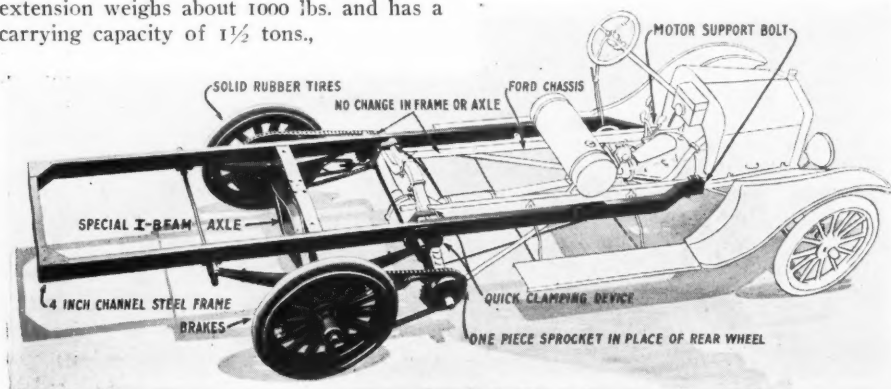


Rear Axle Load-Carrying Member

ing the extension—the axle does not have to be cut off nor is the Ford spring removed. This also eliminates the need for machining a cut-off axle, together with the attendant expense. The change from Ford car to Ton-Truck, and vice versa, requires but a very short time. No drilling of holes in the Ford chassis is necessary, the extension being fastened by quick clamping devices and bolts into original holes in the Ford frame. A feature that has been given special study is the production of an axle that would carry the 50 per cent. overload without buckling, the I-beam axle illustrated being finally adopted.

As in the other Ford converters of the chain-drive type, the Ford rear axle becomes a jack shaft. To this jack shaft and the rear wheels special one-piece sprockets are fastened and rapidly connected with the driving chains. These one-piece sprockets have each been especially designed, patents having been applied for them. They obviate the bolting together of sprocket plates necessitated by other forms of sprockets.

The rear wheels are of artillery type, extra heavy and strong enough for a two-ton truck, equipped with Goodrich standard solid tires. The Ton-a-Ford extension chassis allows a large loading space, giving a total wheelbase of 127 in., with 9 ft., 10 ft. and 12 ft. loading spaces. The gear ratio is about 7:1; the springs are 2 x 44 in. with a relief spring over the axle. The extension weighs about 1000 lbs. and has a carrying capacity of 1½ tons.



The Ton-A-Ford Extension Attached

This unit can be attached or detached as desired, by means of quick-connecting devices, thus utilizing the Ford chassis for both pleasure and commercial use

With each extension chassis is furnished an automatic oiling system for the Ford engine, with sight feed fitting on the dashboard.

In connection with its extensions, the Ton-A-Ford Truck Co. has completed arrangements for the production of Ton-A-Ford brand commercial bodies for ton-trucks.

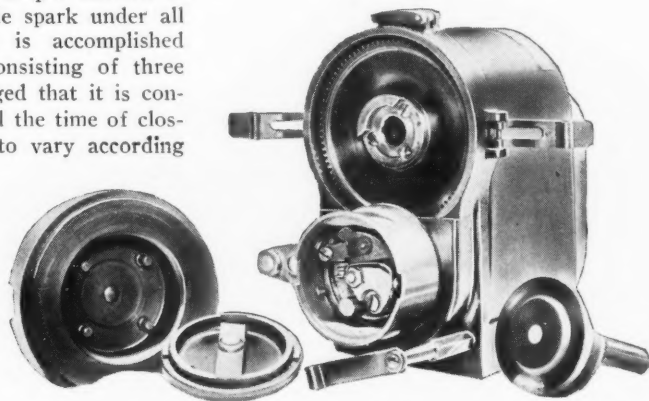
This company is negotiating for the purchase of a large factory to provide space for the rapidly increasing demand for both extensions and commercial bodies. The price is \$345 f.o.b. Racine.

NEW ERICSSON E-41 MAGNETO AND THE ERICSSON BATTERY IGNITION SYSTEM

Announcement is made by the Ericsson Mfg. Co., of Buffalo, N. Y., manufacturer of the well-known Berling magneto, of its new Ericsson battery ignition system. The distributor mechanism is of the closed contact type. It is so designed that the battery consumption is reduced to a minimum at all speeds, although ample current is used to furnish a reliable spark under all conditions. This result is accomplished by the use of a cam consisting of three parts, which is so arranged that it is controlled by a governor and the time of closing of contact is made to vary according

Disassembled View of the Berling Type E-41 Magneto

Showing distributor block, interrupter cover and distributor finger removed.



to the speed of the engine. Thus a length of contact is secured, which is said to give ample spark at low speeds with a minimum battery consumption, and also at high speeds the time of closing of contact is sufficient

to furnish a sure spark. These distributors are made for either hand or automatic control. The Ericsson Co. announces that it will be in a position to make deliveries of the Ericsson battery ignition system in February.

The E-41 Magneto

This company has exhibited at the Show for the first time its latest magneto, type E-41. This magneto embodies quite a departure from former types, in that die castings are used in the frame and end bearings. The type E-41 Berling magneto is of the enclosed, waterproof type. The parts, however, which may need adjustment or attention are easy to get at and can be removed without the use of tools. The distributor finger is self-cleaning; the distributor is provided with brushes, so there is said to be no possibility of carbon deposit and subsequent firing in the wrong cylinders.

The interrupter is exactly the same as used on all Berling magnetos. It is quick and reliable, and has undergone many severe tests in actual use. The condenser is constructed of mica and tinfoil, each mica film being carefully gauged for thickness and tested with a high tension current for defects. The armature construction is

the same as that which has made the Berling magneto so reliable. Norma ball bearings are used. Provision is made for oiling and draining of any surplus oil. The mounting dimensions are standard.

This magneto will be furnished in either independent or dual types. The dual type is a strictly dual system, providing a separate interrupter and coil. The coil and high tension switch are combined in one compact, substantial unit. Deliveries will begin in January.

DENMO ST. LOUIS SALES Co., St. Louis, Mo., distributor of the Denmo truck, which recently opened a show and sales room at 2638 Locust Street, has moved to larger building for sales and service at 618 Walton Avenue. A garage for both pleasure and commercial cars is being conducted and a complete stock of parts for the Denmo has been installed by Charles R. Porter, manager.

CHILTON TRACTOR JOURNAL

Tractors and Trailers Popular in the West

Accomplish More Work at Less Expense. They
Are a Material Aid to Farming and Lumbering

By WARREN EUGENE CRANE

TRACTORS and trailers are coming rapidly into use in the West because they have been proved more economical and efficient than any other form of vehicle. The tractor is replacing horses on the big wheat farms of Eastern Washington, Idaho and Montana, while the trailer is proving of great assistance in hauling grain to the markets and huge logs to the lumber mills.

The Day & Hanson Security Co., of Spokane, Wash., which is farming 10,000 acres of land near Drummond, Wash., has used Holt tractors three years for plowing sagebrush land with heavy disc plows and had very satisfactory results.

D. M. Schoonover, Dayton, Wash., has used a Holt tractor in plowing his 800 acres of land near Fort Benton, Mont. He completed the work in 38 days and was so well satisfied that he has ordered two more tractors for spring delivery.

A Twin City oil tractor is in operation in Park County, Mont., using approximately 7 gals. of fuel per hour under full load. As a rule, tractors are only loaded an average of 75 per cent. of their rated h.p., as there is very little ground where it is necessary to use its full power. The machine is rated at 40 h.p. at the draw bar and 65 h.p. at the belt.

Tractor Insures Increase

C. E. Knox, of Oakes, N. D., uses a Bull tractor for binding purposes and states that he had partly removed the hazard of loss during trying periods. With his tractor and an 8 ft. binder he can harvest from 30 to 37 acres per day and do it more quickly and cheaply than ten first class horses. A short time ago a terrific windstorm leveled and destroyed most of the grain in his vicinity, but he harvested his grain at double speed and saved it from the destructive wind. He has found that there is one reason of importance for tractors replacing horses, more particularly on binders, and that is the fact that Government statistics show that horses not employed on binders for harvesting last three years and a half longer than those which are used upon them. He has found that his Bull tractor has insured him an increase in his crop because of the fact that it operates its bull wheel in the bottom of the previously turned furrow and those lugs or grouser, as they are called, penetrate the sub-soil an additional 3½ to 5 in., equaling the work of sub-soiling attachment. In this way a

furrow plowed 8 in. deep and sub-soiled to 4 in. additional depth gives him 12 in. of furrow depth without turning the new soil to the top.

The Bull Tractor Co., of Minneapolis, conducted an investigation of the results obtained by the sub-soiling device on its machine and received 168 letters in reply, stating that the user's crop had increased anywhere from 10 to 50 per cent., while the average from all of the letters sent out was that an increase of 24¾ per cent. resulted.

A Bull tractor was placed in service on the farm of Nels Anderson in the lowlands near Edison, Wash. In many places the tractor encountered many buried logs, some of which were as much as a foot in diameter, 25 ft. long and buried to a depth of one foot underground. Through a steel cable attached to the tractor, they pulled these dead logs out of the ground.

On the farm of Peter Samuelson, 3 miles from Burlington, Wash., a Bull tractor was attached to a silage cutter and with the aid of a 44 ft. elevator, the big silo on this farm was filled without interruption.

On the farm of Ed. Sisson, in the La Conner Flats, in western Washington, a Bull tractor has been pulling a disc plow and has cut a 20 in. furrow to the depth of one foot in hard pan soil, that it has been impossible to break with five horses attached to the same plow. A record was kept of the work done and it was found that the tractor could do four-fifths of an acre of ordinary stubble, plowing an hour in a working day of ten hours. The gasoline consumption ran from 2 to 2½ gals. per acre and 1½ gal. of lubricating oil was consumed in a 10-hour working day.

A Bull tractor was operated in an alfalfa field on the Lutz farm near Mabton in eastern Washington by W. A. Tyler. It pulled a two-bottom 14 in. plow and pierced the ground to a mean depth of 8 in., traveling 2½ miles per hour. The alfalfa sod was very heavy because the ground had not been plowed in five years, but the tractor did the work more satisfactorily than horses.

On a ranch near North Yakima, Wash., the power from a Bull tractor put up 85 tons of ensilage in 13 hours at a total cost of \$5.06. It burned distillate which resulted in a saving in fuel cost. The work formerly took two days and required two tons

of coal. The ranch owners had previously hired one team to haul water and another to haul coal for the work. These were dispensed with entirely when the tractor was used.

Builds Road and Hauls Lumber

The Puget Mill Co., the largest lumbering firm in the Northwest, has placed a 5-ton White good roads truck and trailer in service, which it is using to haul huge logs a mile and a half from the camp to the dock at Port Gambel, Wash. Work with this equipment was started September 21 and the machine for the ensuing ten days was used in hauling gravel for a road that had to be made. The machine carried an average of twenty loads of gravel each day. The total gasoline used for the first ten days was 107½ gals. and the lubricating oil consumption was 20 gals.

The company kept an accurate account of the work and operation cost of its truck and trailer. On October 2, 33 loads of gravel, 3 yds. per load, were carried, using 6 qts. of oil and 17 gals. of gasoline. On the third they hauled 31 loads with 5 qts. of oil and 16 gals. of gasoline. On October 4 one load of 700 ft. of cedar logs was hauled. The dock was unfavorably situated as the truck had to be backed onto it to unload. The main trouble at the dock was the necessity of pulling up a slight grade in loose gravel and the trailer had to be gotten square with the truck to back onto the dock. On October 5 three loads of timber of 1500 ft., 2000 ft. and 1500 ft., respectively, were hauled with a gasoline consumption of 15 gals. and a lubricating oil consumption of 6 qts.

The truck and trailer carry a maximum weight of 18 tons and operate with a coupling pole which holds the trailer upright. In addition to the pole there are cross chains so that the trailer follows in the track of the rear wheels of the truck even to the extent of going up to a corner and beginning to turn just where the rear wheels of the truck turn. It has the same arrangement as that which is employed in the Northern woods where the logs are handled on sleds. The cross chains make the wheels of the trailer work in unison with the wheels of the truck. The trailer is attached to the frame of the truck.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

The logs are lifted from the truck on the dock by a gin pole which is driven into the bottom of the Sound. From block and tackle at the top of the pole a crotch line is put around the logs and they are pulled up by a donkey engine and thrown into the Sound where they are made into a boom and floated away by tugs to lumber mills at Ballard.

The truck and trailer runs a mile and a half to a gallon of gasoline, and requires 1-10 gal. of lubricating oil each mile.

The operating expense is as follows:

\$.004 per mile for grease.
 .041 per mile for lubricating oil.
 .126 per mile for gasoline.
 .017 per mile for tires.

.061 per mile for miscellaneous and maintenance.

\$.243 or 24 4-5 cents per mile for operation.

The operation cost might seem high for ordinary loads, but it is not exceptional when it is considered that the truck has been carrying 17 tons of timber nearly every trip.

Tractor Repair and Re-equipment Business

An Opportunity for the Dealer and Garage Man

By L. A. SAFFORD, Second Vice President, McQuay-Norris Manufacturing Company

IN the accessory and repair end of the rapidly developing tractor industry lies a field for the automobile garage man and dealer which warrants his closest attention. While many garage men and accessory dealers are already considering whether it would pay them to secure a sales agency for tractors, comparatively few of them thus far realize the tremendous repair and re-equipment business which the tractor development is bound to produce. It is a substantial business already in the sections where tractors are being used and will soon develop enormously.

Regardless of whether the accessory dealer or the farm implement dealer is to become the eventual distributor of tractors, the repair and re-equipment field today belongs to the garage man, and with a little intensive work he can hold it permanently. And few garage men who have not had their attention in some way forcibly called to it realize the tractor possibilities from the repair and re-equipment standpoint.

Garage Equipped to Give Service

The opening of 1917 will find practically two hundred concerns in the United States either manufacturing or preparing to manufacture some type of tractor. All of these machines go into service under the most strenuous conditions to which any gas engine is subjected. All of them will require repairs and re-equipment. Who, but the garageman, is in position to give service on them?

Implement dealers, as a class, are not equipped to do machine work. Fitting of piston rings, grinding of cylinders, rebushing bearings and similar work is beyond them. They have no machine equipment and no demand for it in the implement end of their business. It is a field that is wide open today for the garageman and will require very little cultivation on his part to permanently hold it.

Tractors are bought for service. The farmer who owns one must have immediate service in case of accident or breakdown.

He cannot afford to wait until a new part is shipped from the factory. His automobile may be out of service for a few days with only inconvenience to him, but his tractor out of service during plowing or harvesting means that his business is at a standstill.

After talking with scores of tractor owners at the various tractor demonstrations during the past summer I find that scarcely one of them thinks of the implement dealer from whom he bought his tractor when there is a necessity for new piston rings, spark plugs, grease cups, cable, bearings, or re-equipment of any sort. It is the garageman or the town machinist whom he thinks of and the garageman has the first call because he has been handling the tractor owner's similar re-equipment for his automobile, and the tractor owner realizes that he is in position to give him quick service for all parts.

The very service which tractors render necessitates more frequent replacements than is necessary with pleasure automobiles. In the case of one accessory alone, piston rings, tractor service is many times more severe than anything that is known in the automobile. The clouds of dust in which tractors work produce conditions in the cylinders that magnify the cylinder wear enormously. Piston ring replacements must be made much more quickly on a tractor than on an automobile and the tractor owner is much more quickly aware of this necessity than is the automobile owner. The decrease in power shows itself at once in the operation of the tractor. It decreases the draw bar pull and decreases the working capacity of the machine. He does not postpone the overhauling and re-equipping of his tractor as is frequently the case with the automobile owner.

It is hard for men, even those in the trade, who have not attended one of the great national tractor demonstrations to realize the growth of the tractor industry. One day at the Fremont Show 40,000 people from all over the State of Nebraska with hundreds of visitors from Iowa, Kan-

sas and the Dakotas crowded on to the demonstration field. There were forty acres of automobiles parked as close as was possible.

Garagemen Should Repair

It was not a picnicking, curiosity seeking crowd. There were business men interested in the development of the most important tool ever offered them for use in their business. Garagemen through this Middle West section of the country, where tractors are most widely used today, are beginning to realize their possibilities to them from a business standpoint and to get after this business. Garagemen in this section where the tractor is just introduced need to prepare themselves for this business.

Even though time proves that the implement dealer has awakened to his opportunity on the tractor and is to be the ultimate sales outlet for it, it is up to the garageman whether he holds the repair and re-equipment business or let the implement dealer put in a few machine tools and a repair department and take it away from him. Tractor owners must have service and today the garageman is in the best position to give it.

Talks with scores of tractor owners from the rice fields of Louisiana to the Canadian boundary during the tractor demonstrations show that scarcely any of them depend upon the implement dealer for service. It is only necessary for a garageman to actively seek it in order to secure their business on gasoline, oils, piston rings, spark plugs, grease cups, bearings, cable and the many other re-equipment accessories that are necessary for a gasoline engine. And the farmers who own tractors are the farmers who own stationary engines and automobiles. It means that when the garageman goes after tractor business he goes after this other business as well. It is a tremendously big possibility which warrants the closest attention and cultivation of every thoughtful garageman.

Don't devote fifty per cent of your time trying to hit upon "something new." It pays best to perfect what you have. There are still a few folks left who prefer a truck to an experiment.

What the Tractor is Doing for the Kansas Farmer

By E. H. WHITMAN

THE farm tractor is no longer an uncertain power, giving more or less satisfactory service in the hands of inexperienced operators.

Tractors of all makes are becoming standardized; the buyer is certain of his purchase. The farmer has been receiving an education in the use of tractors and is now capable of obtaining from them the most efficient service.

Probably no state in the Union has so enthusiastically accepted the tractor as an agricultural implement as has Kansas. As the wheat yield of Kansas has increased so has the number and use of tractors. They are not a novelty now; they are a necessity. The number of tractors at work on Kansas farms this year is at least twice that of last year, and the total is being increased at a rapid rate. One company alone claims to have placed one thousand of its tractors in the state. At one time forty carloads of tractors were shipped in one train to Kansas City to be distributed throughout the state. The manufacturers asserted that orders for these 200 machines had been received in the ten days previous. Agents for various makes of tractors claim that their business has never been so heavy.

More Tractors, More Wheat

The story of the increase in the acreage of wheat in Kansas is the story of the increase in the number and widespread use of tractors in the state. Farmers are realizing more and more that early, deep plowing is the best method of insuring the greatest yield of wheat, and the tractor is eminently qualified for that work. The experiment station at the Kansas State Agricultural College has effected an increase of more than thirty bushels of wheat to the acre between deep, early plowing and late, shallow preparation of the seed bed.

During harvest time the intense heat often renders the steady use of horses impossible. The same is true when horses are used for preparing the ground for the next crop. A farmer cannot reasonably expect to get more than seven hours of steady work out of his horses; and then perhaps not the deep, thorough stirring of the soil that he desires. Here is where the tractor makes its value plain. Tireless,

efficient, demanding only fuel and an operator, the iron horse can be made to put in its twenty-four hours of work each day, plowing as deep as the farmer wishes.

All this does not indicate the substitution of the tractor for the horse on the farm. Indeed, there are very many farms where the tractor is not practicable; the farmer himself must be the judge of whether or not power farming on his own particular property will be profitable. The use of the tractor does not tend toward the elimination of the horse for farm work, but it does tend toward taking from the horses the muscle-straining, life-shortening, heavy work which must be done on any

position because of the cost of shipment and operation, others assert that all advertising costs something and that this method produces valuable results. It is not easy to over-estimate the value of these demonstrations to the prospective buyer. They enable him to get first-hand, right-to-the-point information on operating the machine, to compare the merits of the different makes, to decide between the small and large tractors for general farm use, and, in short, supply him with information to meet the immense demand for greater knowledge of tractors and power farming.

The agencies for the different makes of tractors are mostly in the hands of im-



A Plowing Demonstration With an Iron Horse

large farm. The steady increase in the price of horses in the past ten years is a strong argument for the substitution of the tractor for this heavy work.

The increasing efficiency of the small tractor is becoming a large factor in the use of the machine. Dealers report that the small tractor is the popular machine, and this claim is supported by sales reports of many different companies.

While some dealers regard the tractor demonstrations as a rather expensive prop-

plement dealers. The opinion seems to prevail among dealers that the tractor is an agricultural implement and that, since other implements not handled by the automobile dealer are necessary to complete the tractor outfit, the machine naturally falls to the province of the implement dealer.

Opinions vary widely as to this, however. Many of the motor car dealers who handle the agencies for tractors are of the opinion that the tractor sells well when the agency is in conjunction with an automo-



A Typical Scene on a Large Western Farm Where the Tractor Plays the Principal Role

Interesting and helpful information; reputable advertisements—that's the CCJ

bile agency. One dealer even went so far as to say that the only successful way to handle a tractor agency is in conjunction with the agency for some make of motor car, but he based this opinion on his own success.

Many small town dealers take the agency for an automobile, a line of farm machinery and a tractor, and find that the combination works well.

One young tractor agent who has only had one year of experience in the work asserted that farmers to whom he had sold tractors last spring had reported to him that if they had not been supplied with the machines during the past summer they would not now have any wheat planted, as the dry weather made plowing at the proper time and the proper depth by the use of horses an almost impossible feat.

MOLINE UNIVERSAL TRACTOR A Medium Weight Tractor for the Average Size Farm

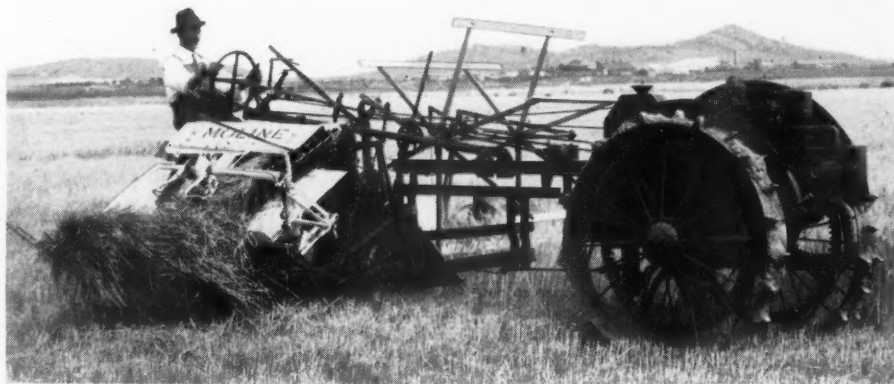
One of the features of this tractor to which the manufacturers call particular attention is the fact that all farm implements used with this machine are attached directly or close coupled to it, thereby enabling the operator to sit in the seat of the implement the same as if he were driving horses. This brings all levers within convenient reach to the operator so that he can observe the work being done. It makes the tractor a strictly one-man proposition and removes the operator from any possible heat or vibration of the engine.

This tractor, which is built by the Moline Plow Co., of Moline, Ill., is of the two-wheel type. The front wheels are used for driving, and the implement attached forms the rear wheels. This makes a compact unit, easy to guide and handle, will back as easily as go forward, permits close work in

small fields and short corners, and lifts itself out of dead furrows and ditches. The Moline-Universal tractor will plow from 4 to 12 acres a day, which is more than enough for the average sized farm. It will do all other field work, such as harrowing, cultivating, mowing, drilling, etc., and will give 10 to 12 h.p. on the belt.

For plowing, one wheel is run in the furrow, which makes the tractor practically self-steering and leaves only 1400 lbs. of weight traveling on the surface of the unplowed land. The wheel in the furrow insures an even width for the front furrow. The body of the tractor stands level with

is not heavy enough to withstand the enormous strain when pulled by a powerful tractor. Therefore, it has given special attention to the plow attachment which accompanies this outfit. The lift of the plow, the placing of the depth levers within easy reach of the operator, the power lift, the arrangement to prevent trash from choking or clogging the face of the furrow and the land wheel, the lining up of the furrow wheel, and every other vital point for successful plowing have been carefully designed and thoroughly tested. Steel bottoms or chilled bases are furnished to suit any soil conditions.



The Moline Universal Tractor Close-Coupled to a Binder

one wheel in the furrow. To accomplish this the left drive wheel is moved up on the frame through a slot and is locked by two bolts. A truss bar between the bull pinion and the axle holds the wheel true to the pinion in either position. One man can easily and quickly raise or lower the wheel.

The price of this tractor is \$790 f.o.b. Moline. This price includes the tractor and a two-bottom 14 in. gang plow. The makers contend that the standard horse-drawn plow

Another feature which commends this tractor for the average size farm is that it has a 31 in. vertical clearance, whereas the ordinary cultivator has only from 29 to 30 in. arch clearance. This tractor is open through the center, which gives the operator a clear view ahead.

The belt power is ample to operate any stationary farm machinery. It is equipped with a 6 in. and 8 in. diameter pulley. This pulley is at the front of the machine, where it ought to be for the greatest convenience. The belt can be quickly put on and tightened by blocking the tractor wheels.

Brief specifications of the tractor follow:

Engine, 4 $\frac{3}{4}$ in. bore, 6 in. stroke; two cylinders opposed, cast in block, detachable heads; lubrication, automatic force feed oiler; heavy truck type, honeycomb radiator, water circulation by gear pump, air circulation by 16 in. fan; Holley automatic carburetor; centrifugal ball type governor; ignition by high tension Dixie magneto; transmission gives one speed forward, one reverse; cone type clutch, Raybestos faced; 52 in. drive wheels, 9 in. in diameter, legs or cleats furnished to meet all soil conditions; extension rims 6 in. wide furnished as an extra; weight, approximately 2800 lbs.; complete tool equipment. This tractor will turn completely around in a 16-ft. circle.



The Moline Universal Tractor Pulling a Disc Harrow

Note that the operator sits directly over the farm implement, thus enabling one man to guide the tractor and also watch the implement

HERSCHELL-SPILLMAN Co., N. Tonawanda, N. Y., on December 30 paid a 100 per cent. stock dividend and in addition to that the regular quarterly cash dividend of 2 per cent.

THE STANDARDIZATION OF GAS TRACTOR RATINGS*

By RAYMOND OLNEY, Editor of Power Farming

OPINIONS vary considerably as to just what should constitute a standard tractor rating. Some prefer to have it in terms of drawbar and brake or belt horsepower, others in terms of brake horsepower alone, and still others in terms of brake horsepower and pounds drawbar pull, or even in terms of brake horsepower, pounds pull and tractive speed.

Until recently it has seemed unnecessary to include the drawbar horsepower in the rating, for if pounds pull at the drawbar and tractive speed in m.p.h. were given, the pulling capacity in terms of horsepower could be readily calculated by multiplying the pounds pull by the miles per hour and dividing the product by 375. Furthermore, the engineer and not the man who buys the machine would care especially about knowing the drawbar h.p. But there is a very logical reason from the standpoint of the manufacturer why the drawbar horsepower should be included in a standard rating.

If a manufacturer builds his machine better than some of his competitors, that is, if he improves it in design, material and workmanship and increases its efficiency by using anti-friction bearings, cut steel gears running in oil, etc., naturally a higher percentage of power available at the crankshaft will be delivered at the drawbar. In other words, a tractor that was previously rated at 10-20, may, by these improvements, be rated at 12-20. With future developments in tractor design and construction, I am of the opinion that we will in time see at least 75 to 80 per cent. of the brake horsepower made available at the drawbar.

It is very desirable, from the standpoint of both manufacturer and purchaser, that the rating establish the tractor's efficiency.

Therefore the titular rating, or that part of the rating ordinarily used in designating the different sizes and capacities of tractors, should be expressed in terms of drawbar and belt horsepower, using the double number, 10-20, 12-20, 12-25, etc. In addition to this, and for the benefit of tractor customers, I would also include in all catalogs and other printed literature, as a part of the standard rating, a complete set of rating specifications, which would consist of belt horsepower, drawbar horsepower, drawbar pull in pounds, engine and tractive speeds, and other necessary data. Observe that I indicate "belt" horsepower and not "brake" horsepower; the farmer is interested in the power available at the belt pulley and not at the crankshaft.

The belt horsepower rating should express the horsepower that the manufacturer will guarantee the engine of his tractor, when in good condition and properly operated at normal speed, to deliver at the belt pulley continuously for a period of two hours.

The drawbar horsepower rating should express the horsepower that the manufacturer will guarantee his tractor, when in

good condition and properly operated, to deliver at the drawbar continuously for two hours, on a firm, dry, level earth road, with the engine running at normal speed and with the tractor traveling at its rated plowing speed. This rating should be based on the results of actual dynamometer tests.

The pounds pull rating should express the drawbar pull in pounds that the tractor, when in good condition and properly operated, is guaranteed to deliver continuously for two hours on a firm, dry, level earth road, at the different tractive speeds, or gear ratios, and with the engine operated at normal speed.

It seems highly essential that the catalog specifications include the drawbar pull in pounds at the different tractive speeds. Drawbar capacity expressed only in horsepower is not sufficient, because the term "horsepower" is easily misunderstood by the average farmer, especially when applied to the drawbar horsepower of a tractor. He is quite apt to think of a mechanical horsepower as equivalent to the power of a horse. Another reason for including the pounds pull rating is to enable purchasers when making a selection to compare, in terms they are more apt to understand, the pulling capacity of the different makes and sizes of machines.

Furthermore, the draft of field implements and machines is expressed in pounds, which makes it desirable for the prospective purchaser in selecting the size of machine best adapted to his requirements, to know how many pounds pull the different tractors on the market are guaranteed to deliver. Then again, if the manufacturer states the pounds pull of his machine, the farmer may satisfy himself as to whether or not it will actually deliver that amount by testing it out with a dynamometer, which any responsible tractor concern would be glad to provide for the purpose.

It has been suggested, and the suggestion has been favorably received by a great many, that the rating of tractors should be performed by some disinterested organization, possibly by the office of public roads and rural engineering of the United States Department of Agriculture. I am not in favor of a government test for tractors. I believe that the manufacturers should be allowed to work out their own salvation in this matter, but in this connection I feel that this society and other organizations concerned with the development of the gas tractor can be of invaluable assistance to the tractor builders in establishing a suitable standard rating.

The logical organization to adopt and put into effect a standard power rating for gas tractors is the National Association of Tractor and Thresher Manufacturers, and the rating established by that association should be the only official tractor rating. This society should co-operate with the manufacturers' association on this matter and encourage the adoption by that organization of a standard rating, and after its adoption this society and all other organizations interested in farm tractors should join in making the N. A. T. T. M. standard the universal standard in this country.

THE FUTURE FOR THE TRACTOR Prediction Made at Hyatt Sales- Conference Dinner

"It naturally follows that the tractor must replace the horse if farm production is increased to a point where enough food stuffs are raised to supply the country with its rapidly increasing population. This is becoming a recognized fact."

It was in these words that A. P. Sloan, Jr., general manager of the Hyatt Roller Bearing Co. and president of the United Motors Corporation, expressed his faith in the future of the tractor industry at the closing of the annual sales conference of the tractor bearings department of the Hyatt Roller Bearing Co. This conference was held at Chicago the evening of Wednesday, December 6, at a dinner given to the departments by Mr. Sloan.

"Farm production, or more specifically—the raising of food stuffs—is largely a question of power," said Mr. Sloan. "The combined horsepower used on farms amounts approximately to thirty millions, which is more than the combined horsepower of all other industrial power plants.

"It is estimated that farm lands are producing only 40 per cent. of their potential capacity and that this production can be increased at least 50 per cent. by having sufficient power available. Although horses are now the chief source of power for farm work, it is unreasonable to believe that they can meet the demands for power. It naturally follows, therefore, that the tractor must replace the horse. Tractors to accomplish this must be more scientifically constructed; they must be more efficient. The farmer wants greater reliability, he wants the maximum power delivered to the drawbar. He can only get greater power at the draw-bar through the elimination of friction, and other causes which consume power and are unproductive. Anti-friction bearings in tractors go a long way toward giving the farmer greater reliability and more power."

The guests of Mr. Sloan at the dinner were: C. M. Eason, manager of the Chicago department; H. O. Kuechenmeister, assistant sales manager; F. A. Dean, chief draftsman; J. R. Bateman and O. W. Young, sales engineers; T. A. Russell and C. E. Stoddard, of the engineering department; L. S. Newman, mechanical inspector; J. E. Martin, engineer of tests; H. M. Carroll, advertising department, and H. T. Ewald, advertising counsel.

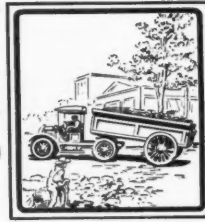
IRON-MINING RECORDS SMASHED

The January first estimates of shipments of iron ore from the mines during 1916 are 75,500,000 gross tons, compared to 55,493,100 tons for 1915, according to Ernest F. Burchard, of the United States Geological Survey, Department of the Interior. Not only are these record-breaking figures, but the ore sold for \$178,935,000, an increase of over \$77,000,000 compared with 1915. Ore in stock at the mines approximates 10,486,000 gross tons, compared with 13,748,000 tons in 1915. Production of pig iron also made a record in 1916 with a total of over 39,000,000 gross tons, compared with 29,916,213 tons in 1915.

*From a paper before the American Society of Agricultural Engineers, at Chicago, December 27, 28 and 29, 1916.



TRAILER DEPARTMENT



Truck and Trailers Factor in Paper Conservation

By FRANK REED

THE paper situation is being reflected in shortage and high prices of pasteboard and fibre packages of all types. This material is prepared from waste paper picked up and sorted by an establishment specializing in this business. The Economy Paper Co., of Los Angeles, relates an experience with motor truck and trailers which shows how necessary they are to this kind of a business. It not only protected its income, threatened by car shortage which interrupted the normal course of delivery between its sorting plant and the pasteboard mill, but gets the waste paper from small towns which was never considered as a possible source of supply until the company purchased its motor hauling equipment.

Motor Equipment Indispensable

Charles Gordon, secretary of the Economy Paper Co., says: "If we had not owned a truck in the past few weeks we would have been in the worst predicament of our business history. We have been in the habit of telephoning for cars and getting them spotted at our warehouse promptly for local shipments to the mills that purchase sorted paper from us. The car shortage caused the railroad to shut off this service. When our warehouse began to get overcrowded we put a 5-ton truck and two trailers, L. A. Trailer Co. Utility type, 5 and 3½ tons respectively, on the job. For 10 days, working from 7 A. M. to midnight, we moved 60 tons a day over a 2½ mile haul to the mills, returning empty. One big day we hauled 83 tons. This short haul is made for about \$.25 per ton, the

same rate the railroad charged us, but we get the advantage to our general operation of having a completely reliable service, wholly under control. We do this hauling ourselves cheaper than we could hire it done by truck. In addition we use truck and trailers for regular collection trips, bringing in waste paper from cities up to 60 miles distant. We have added, since owning the truck, collection service covering the small towns. It takes so long for one of these small towns to accumulate a carload of waste paper that they have never saved it. Now we can pick it up every month, and are getting 200 tons a month from these places that was formerly lost. If similar results were obtained throughout the country the motor truck would be a factor in paper conservation that would achieve extremely creditable results.

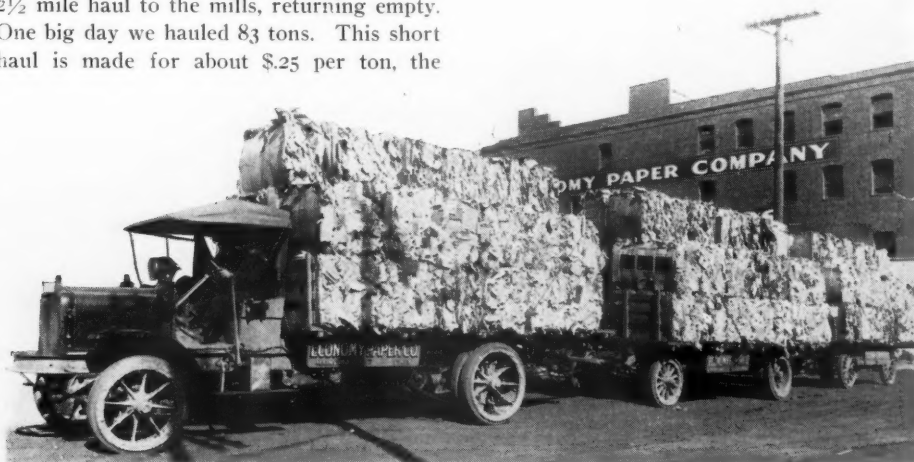
"In Santa Ana we have to pull our paper out of the river bed through 300 yards of sand. We were never able to hire anybody to do this, but by getting a first-class truck we mastered this proposition and have never had any trouble. In fact we have operated both truck and trailers for four months without spending a cent for repairs. We aimed to get trailers of the best qual-

ity, and think the extra investment is more than made up in satisfactory service."

Trailer Produced Profits

Mr. Gordon relates his experience preliminary to purchasing trailers which confirms the idea advanced in an editorial in Automobile Trade Journal that many business men are taking hold of trailers without being inspired by salesmen, either in the truck or trailer trade. They were hiring a truck operator to bring in 5 tons at a load from a point 30 miles distant. He complained of the price and Mr. Gordon asked him why he didn't get a trailer and bring 10 tons at a trip. The man did this and made no more complaint on the price, so they concluded he was making a profit. When they decided to get their own equipment they did not have to be "sold" on the trailer idea. Mr. Gordon said, "The man seemed so tickled to get our work after he took on the trailer that we figured a trailer was the dope."

The waste paper business allows a margin between cost and selling price which varies considerably with the grades, but averages around \$4 a ton, on a buying price averaging about \$10 a ton. In this margin the paper has to be picked up, brought to a large and substantial plant, cleaned, sorted, rebaled, shipped and delivered. Hauling efficiency and economy play an important part in maintaining the profitable operation of the business, and the Economy Paper Co. has found its truck and trailers an exceedingly satisfactory investment. An interesting fact is that the use of this equipment has brought the business a much greater public notice than it ever had before, which is bound to have a tendency to cause the accumulation of waste paper by people who had never realized its marketability.



Truck and Two Trailers Utilized for Paper Conservation

By using a five-ton truck and two L. A. Trailer Company Utility trailers, the Economy Paper Company has avoided car-shortage damage, and handles two hundred tons a month from small towns that never accumulated paper enough to ship by freight.

TROY TRAILER SALES Co. has been incorporated under the laws of the State of Ohio by C. S. Geuger, C. N. Peters, G. R. Harris, R. C. Sykes and H. H. Tamplin. The Troy Wagon Works Co. will hereafter market its Troy trailers under the name of the Troy Trailer Sales Co.

A. D. SMITH, president, and E. L. Rosenfeld, general manager of the Smith Motor Truck Corp., Chicago, entertained 27 members of the sales executive force of the company on December 26th, at a banquet in the Hotel Blackstone, which ended a three days' conference.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

TRAILERS TRIPLE BRICK MAKER'S DELIVERY FACILITIES

The illustration below shows a fleet of trucks and trailers operated by the Washington Brick & Terra Cotta Co., of Washington, D. C. This concern, up until September, 1915, used teams for its delivery, but as the delivery became too heavy for same they purchased a 3½-ton Signal truck. This truck was used for some time, when Mr. Carlson, manager of the Troy Wagon Works Co.'s Washington branch, introduced the trailer idea to the brick company. A Troy trailer of 2½ tons capacity was accordingly put in service. This, together with the truck, brought the cost of the train up to \$3768, but this gave them an unusually large delivery facility, considering the amount of money invested. The first truck chassis alone cost \$3000, while the price of the trailer was \$768. Bodies for both the truck and the trailer were built at the company's yards.

After the trailer was added, thus doubling the capacity of the truck, things began to look brighter for the management, for they were now looking forward to a great saving from this particular department.

They used this first outfit with such great success that in February, 1916, they purchased another 5-ton truck, together with a 5-ton Troy trailer, instead of a 2½-ton as previously purchased. It was a very short time till they purchased another train of similar manner. This completes their fleet of three trucks and three trailers.

Big Increase in Carrying Capacity

The increased carrying capacity afforded by the trailers is notable. The first outfit purchased, as before stated, consisted of a 3½-ton truck and a 2½-ton trailer, 2600 common bricks per trip, the truck carrying 1600 and the trailer 1000.

The 5-ton trucks and trailers have a carrying capacity of 3400 brick per train, the truck carrying 1800 and the trailer 1600. In addition to hauling common brick, these trucks are used for hauling Harvard face bricks and sometimes hollow tile.

This company has three yards operating in the vicinity of Washington with a total daily capacity of 200,000 bricks. The trucks and trailers are used for the most part in making deliveries from its Pontiac yard at Addison, Va., a distance of about four miles from the Capitol city. There is somewhat of a grade between Addison and Washington, but this does not cut down the speed of the truck to any great extent. Each truck carries a crew consisting of an

operator and four men for unloading the brick. There is an ordinance in Washington against the dumping of brick, so that all brick has to be piled except in special cases. While, at first thought, it would seem that this obstacle would rob the trucks and trailers of much of their efficiency and ability to lower the delivery costs, yet this is not the case.

The teams had not been able to make more than two trips a day at any time. In contrast to this performance the trucks make four and five trips a day, the large ones carrying 3400 bricks, while the best a team can do is to carry a little less than 1600 bricks each trip. Mr. Miller, manager of the Washington Brick & Terra Cotta Co., states that his teams cost him \$4 a day. While he has not kept an accurate record of what his trucks and trailers are costing him, he figures that they earn him a gross sum of \$40 a day, inasmuch as they do the work of from eight to twelve teams or an average of ten teams daily.

WHEN MOTOR POWER STEPS IN PROFITS INCREASE

A case of where the use of the motor power increased the earning capacity of a former horse drawn trailer equipment is illustrated in the following incident: The Turner Moving Co. is operating Ford chassis with trailers. By removing the body of the auto and placing a fifth wheel over the

rear axle, and removing the front running gear from a formerly horse drawn van, a trailer is made with which a load may be carried of more than three times the capacity of the little truck. The fifth wheel is designed and patented by Mr. Turner himself. It is roller bearing and has extreme flexibility. With one such contrivance, now in use, the empty trailer or van with only the rear wheels upon the scales weighs 5200 lbs., and the little truck pulling it appears to have no difficulty in traveling right along when the van is loaded with 6000 lbs. of freight. The rear tires of the regular equipment are placed upon the front wheels and Kelly-Springfield over-size tires placed upon the rear wheels where the Ford chassis is used in this capacity. The improvement in service is easily shown by a comparison in the earning capacity of the same van under horse drawn power. With three horses and two men the van could earn \$1.50 an hour, \$12 in eight hours. Since it has been changed to an auto trailer two men have earned as much as \$24 in 7 hours and 40 minutes.

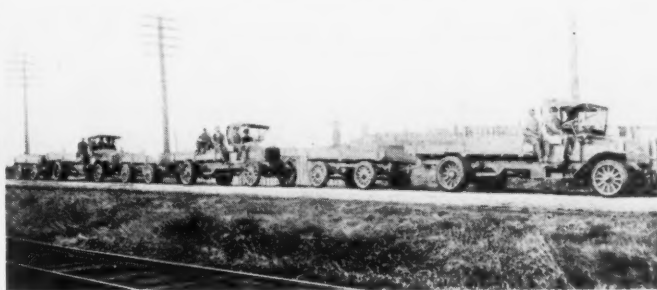
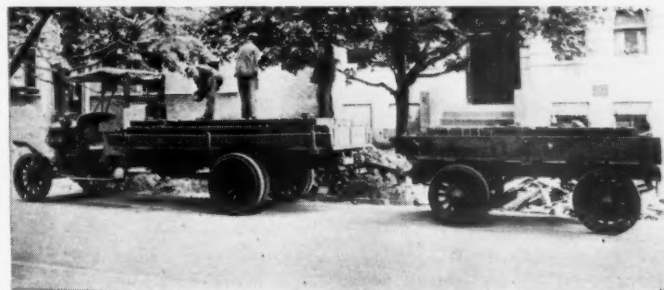
LONE STAR CO., El Paso, Tex., has taken the agency for the Troy motor truck trailer with territory comprising El Paso and all New Mexico south of Albuquerque.

O'ROURKE-MULLER MOTOR CO., 853 Carondelet Street, New Orleans, La., is now handling the Troy motor truck trailer and has a full line at its salesrooms.



Trailer a Boon to the Tin-Roofer and Heater Man

If there is one business in which a trailer should prove most satisfactory, it is in the roofing and heater business. In this business, bulkiness rather than weight is the factor to be considered. In the illustration a good example is afforded of the work being done by a Parry trailer for an Indianapolis heating concern. The trailer makes it possible to readily carry the heater drums. Without the trailer, this load would have to be pyramided on the truck with the consequent loss of time in roping the parts.



On the Left Shows the Truck and Trailer Unloading, and on the Right is the Company's Fleet

Merit wins—that's why the CCJ is the leader

MIAMI TRAILER

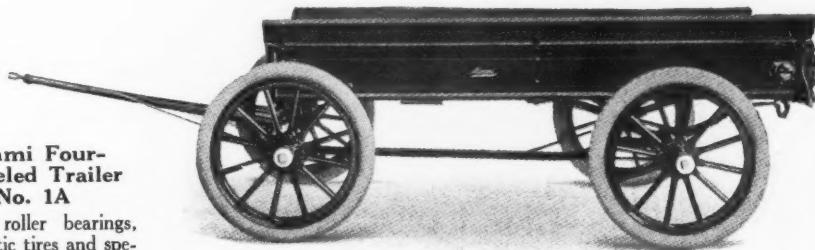
The Miami Trailer Co., Troy, Miami County, Ohio, is manufacturing a line of trailers designed to be used in connection with pleasure or commercial cars. Aside from body forms and tires the 4 wheeled trailers, offered by the company, are nearly identical; the same may also be said of the two wheelers. A review of the major specifications reveal the fact that all have 1 1/4 in. Timken axles, fitted with Timken roller bearings. They have 32 in. artillery wheels with 1 1/4 in. spokes and 1 1/4 in. rims, as standard equipment both front and rear. The tires used are generally of 1 1/4 in.

Model No. 101, have rear electric lights. As to weight they vary according to the

model, from 290 lbs. to 500 lbs., and have capacities varying from 800 to 1250 lbs.

Miami Four-Wheeled Trailer No. 1A

Has roller bearings, pneumatic tires and special shock-absorbing drawbar.



Miami Two-Wheeled Trailer No. 100

A carrying capacity of 800 lbs. makes this model particularly available for hauling light, bulky loads.



The 4-wheeled models range in price from \$130 to \$165.

The two-wheeled trailers, which are for lighter hauling, are model No. 100, which sells for \$75 and model No. 101, the price of which is \$66. The maker calls attention to the special bodies furnished to meet the requirements of many kinds of hauling.

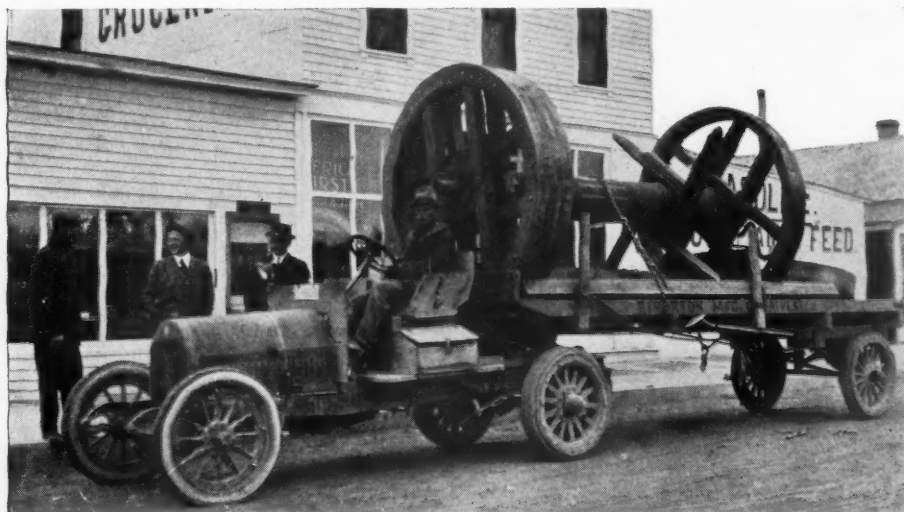
THE HARPER TRAILER

The Harper Buggy Co., of Columbia City, Ind., calls attention to its light weight trailer which is fitted with a special connection or hitch that makes it possible to attach

solid rubber, although pneumatic tires are sometimes used, especially on model No. 1A. These trailers have short-turn gears which are carefully designed for the special requirements of this class of hauling. The springs are oil tempered and semi-elliptic, being 1 1/2 x 38 in. with six front leaves, with the same dimensions on the rear and five leaves. The track of these trailers is 56 in. while their height from ground to the bed is 26 in. A feature of this special trailer is found in connection with the drawbar which is said to be an efficient shock absorbing device. All trailers are finished in black and are striped and varnished and all but one, which is



The Harper Light-Weight Trailer and the Connection or Coupler



A Serviceable Outfit Built From a Variety of Units

H. B. Hughes, proprietor of the Riverton-Dubois Transportation Company, who runs a motor freight line between Riverton and Dubois, Wyoming, built the above outfit. The car is an old Buick, the axle a Russel two ton, while the connection between the car and trailer is taken care of by a Martin rocking fifth wheel. The rear end of an old Frayer-Miller two-ton truck is incorporated in the trailer. This outfit weighs 7,500 lbs., and carries 8,000 lbs. a distance of eighty miles per day.

this trailer to any car no matter what position the car or trailer is in.

This trailer is furnished either with Timken roller bearing axle, allowing a speed up to 35 m.p.h., or a plain spindle axle, speed up to 20 m.p.h. The specifications of the trailer are as follows: Inside body measurements, 8 x 40 x 72 in., either with or without flareboards; ash sills and yellow poplar panels; 34 in. wheels with either 1 1/8 or 1 1/4 in. tread, steel or solid rubber tires; springs, 44 x 1 1/2 in., 6 leaf; standard track; weight with steel tire equipment, about 280 lbs.; with rubber tires, about 295 lbs.

CYGNET REAR CAR Co., Buffalo, N. Y., manufacturers of trailers for automobiles and rear cars for motorcycles, has leased a 3-story factory at 408 DeWitt Street, and will equip it.

MOTOR & ACCESSORY MANUFACTURERS recently elected the following concerns to membership: Automatic Carburetion Co., Chicago; Superior Lamp Mfg. Co., Chicago; Warner & Swasey Co., Cleveland, and the Metal Stamping Co., Long Island City.

The CCJ is built upon the lasting foundation of honest circulation

An Accounting System for Dealers

By WILLIAM B. WILSON. Text by C. P. SHATTUCK

(Copyright 1916, William B. Wilson)

(Continued from our November issue)

THE flexibility of an accounting system depends on the original layout, and if the system be so condensed that it cannot be departmentized, its value is, necessarily, limited. In other words, one department should act as an automatic check on another, which is possible with the Wilson system which has many advantages over the usual condensed systems. Of particular interest is the policy-insurance register which greatly simplifies the work of keeping track of the policies, and the Wilson method of handling notes presents interesting features. That for keeping track of the money paid to the salesmen is another valuable feature, for with it the sales manager can determine instantly the actual value of each salesman; that is, whether the salesman is a producer or vice versa.

The plates presented and supplemented with the following will present to the reader a very lucid idea of the working of the system.

- Plate No. 8 Cash Book Receipts.
- Plate No. 9 Cash Book Disbursements.
- Plate No. 10 Petty Cash Distribution.
- Plate No. 11 Weekly Pay Roll.
- Plate No. 12 Petty Cash Voucher.
- Plate No. 13 Notes Receivable and Charge Ledger, Combination Covering Defaulted Notes.
- Plate No. 14 Insurance Register.
- Plate No. 15 Left Side, Combination Sales and Cost Register.
- Plate No. 16 Right Side, Combination Sales and Cost Register.
- Plate No. 17 Sales Orders in Sets of Five Showing Accounting Department Sheet.
- Plate No. 18 Left Side, Purchase Register.
- Plate No. 19 Right Side, Purchase Register.
- Plate No. 20 Purchase Requisition.
- Plate No. 21 Purchase Order.
- Plate No. 22 General Journal.
- Plate No. 23 Journal Voucher.
- Plate No. 24 Manifold Pay Statement.
- Plate No. 25 Manifold Invoice.
- Plate No. 26 Cost Sheet, Second Hand Trucks and Improvements.

Plates 8 and 9 show the cash received and disbursed, and the special feature of this form of cash book is the notes receivable division, showing the discounted notes which are handled in large groups. It will be noted that there are columns for expenses and purchases (plate 9) which, in departmental work, are not used as all payroll and petty cash segregations are purchased on a voucher and entered through the purchase register.

Plate 10 is a recapitulation of the petty cash vouchers. (See form plate 12.) The petty cash distribution sheet is made in duplicate and treated as a purchase voucher entering same through the purchase reg-

ister under control account No. 18 and is refunded by the cashier through his cash control account No. 18. These controls are checked in the purchase register and the cash book so that the items are posted only in the monthly totals. The petty cash voucher, plate 12, is the cashier's receipt for money paid out of the contingent fund, and the sheets are summarized on the petty cash distribution sheet (plate 10) weekly or oftener as may be desired. The amount of the contingent fund varies from \$100 to \$1,000, according to the requirements of the cashier.

Plate 11 is the weekly pay roll sheet which combines administration, selling and shop, regular and overtime. The pay roll sheet is controlled through the purchase

register and cash book in the same manner as the petty cash distribution, plate 10. Special attention is called to the distribution of the salaries of the salesmen in the purchase register (plate 18) which includes a column headed "Salesmen's Salaries." In this column the salaries are itemized and posted from the pay roll sheet and charged each individual drawing account, the cash drawn by each salesman. Against this the salesman is credited regularly his commissions. This account represents a very valuable source of information to the sales manager, as he can obtain and instantly from the accounting department, all data relating to his men. The account shows the value of each salesman for, if a debit balance exists, it indicates that the sales-

The image shows a stack of three business forms from R. E. Taylor Corporation. The top form is a "Trucks - Cars" order form (Plate 25) with a circular logo and fields for "Sold to", "Model", "Chassis", "Tag #", "Address", and "Remarks". The middle form is a "PURCHASE ORDER" (Plate 26) with fields for "To", "Chassis #", "Tag #", "Address", and "Remarks". The bottom form is a "PURCHASE ORDER" (Plate 21) with fields for "To", "Chassis #", "Tag #", "Address", and "Remarks". Each form has a circular stamp with a number (#25, #26, #21) and a signature.

Plates Nos. 21, 25 and 26

Make your product pay—advertise in the CCJ

man is falling off in his stride. When such a condition exists and the figures can be instantly obtained by the sales manager, it is not likely that a salesman will continue to overdraw his account without the consent of the sales manager. With the Wilson system the sales manager or other officials of the company can obtain the desired data in a few seconds. Similarly a credit balance would indicate the efficiency of the salesman, or at least, it would show that he is giving service for value received. If the salary of a salesman working on a commission basis of 5 per cent. exceeds the commissions earned, the difference is charged off against the salesmen liquidation account No. 23, plate 6, and similarly if the salesman produces a profit on

the 5 per cent. commission basis, the liquidation account is credited. Only salesmen showing a credit balance can compete for prizes or bonuses.

Plate 13 deals with notes receivable and one of its valuable features is that it enables the cashier, who generally controls the notes, to ascertain easily and quickly the exact condition of each customer's notes, particularly defaulted notes. In the case of a default the maker is charged with the total costs which include face value, interest, protest fees, etc. With the Wilson system the cashier has all this information in front of him, eliminating the time usually wasted in consulting the bookkeeper and running to the heads of the various departments. It also does away with the

separate note ledger. All defaults are entered by the cashier, the customer notified, etc., and the data automatically goes to the bookkeeper.

Plate 14 is the policy-insurance register, an important component of any accounting system wherein policies are taken out from time to time, for varying amounts and periods. Mr. Wilson lays great stress upon his insurance register which is a big improvement over the regular book issued by the insurance companies. The regular book running in months gives expiration dates only and it is an easy matter to overlook or forget these dates, particularly where a large number of policies are being carried as with selling trucks. In some instances and where the policy is

CASH DISBURSED 191

SHEET NO. _____

CONFIDENTIAL BY WILSON

DATE ACCOUNT MEMORANDUM

#9 *Right Side*

CASH RECEIVED 191

SHEET NO. _____

CONFIDENTIAL BY WILSON

DATE ACCOUNT MEMORANDUM

#8 *Left Side*

R. E. TAYLOR CORPORATION
R. E. TAYLOR, PRES.

PAY ROLL

DEPARTMENT _____

WEEK ENDING _____ 191

EMP. NO. NAME

REG. 1. REG. 2. REG. 3. REG. 4. REG. 5. REG. 6. REG. 7. REG. 8. REG. 9. REG. 10. REG. 11. REG. 12. REG. 13. REG. 14. REG. 15. REG. 16. REG. 17. REG. 18. REG. 19. REG. 20. REG. 21. REG. 22. REG. 23. REG. 24. REG. 25. REG. 26. REG. 27. REG. 28. REG. 29. REG. 30. REG. 31. REG. 32. REG. 33. REG. 34. REG. 35. REG. 36. REG. 37. REG. 38. REG. 39. REG. 40. REG. 41. REG. 42. REG. 43. REG. 44. REG. 45. REG. 46. REG. 47. REG. 48. REG. 49. REG. 50. REG. 51. REG. 52. REG. 53. REG. 54. REG. 55. REG. 56. REG. 57. REG. 58. REG. 59. REG. 60. REG. 61. REG. 62. REG. 63. REG. 64. REG. 65. REG. 66. REG. 67. REG. 68. REG. 69. REG. 70. REG. 71. REG. 72. REG. 73. REG. 74. REG. 75. REG. 76. REG. 77. REG. 78. REG. 79. REG. 80. REG. 81. REG. 82. REG. 83. REG. 84. REG. 85. REG. 86. REG. 87. REG. 88. REG. 89. REG. 90. REG. 91. REG. 92. REG. 93. REG. 94. REG. 95. REG. 96. REG. 97. REG. 98. REG. 99. REG. 100. REG. 101. REG. 102. REG. 103. REG. 104. REG. 105. REG. 106. REG. 107. REG. 108. REG. 109. REG. 110. 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REG. 1010. REG. 1011. REG. 1012. REG. 1013. REG. 1014. REG. 1015. REG. 1016. REG. 1017. REG. 1018. REG. 1019. REG. 1020. REG. 1021. REG. 1022. REG. 1023. REG. 1024. REG. 1025. REG. 1026. REG. 1027. REG. 1028. REG. 1029. REG. 1030. REG. 1031. REG. 1032. REG. 1033. REG. 1034. REG. 1035. REG. 1036. REG. 1037. REG. 1038. REG. 1039. REG. 1040. REG. 1041. REG. 1042. REG. 1043. REG. 1044. REG. 1045. REG. 1046. REG. 1047. REG. 1048. REG. 1049. REG. 1050. REG. 1051. REG. 1052. REG. 1053. REG. 1054. REG. 1055. REG. 1056. REG. 1057. REG. 1058. REG. 1059. REG. 1060. REG. 1061. REG. 1062. REG. 1063. REG. 1064. REG. 1065. REG. 1066. REG. 1067. REG. 1068. REG. 1069. REG. 1070. REG. 1071. REG. 1072. REG. 1073. REG. 1074. REG. 1075. REG. 1076. REG. 1077. REG. 1078. REG. 1079. REG. 1080. REG. 1081. REG. 1082. REG. 1083. REG. 1084. REG. 1085. REG. 1086. REG. 1087. REG. 1088. REG. 1089. REG. 1090. REG. 1091. REG. 1092. REG. 1093. REG. 1094. REG. 1095. REG. 1096. REG. 1097. REG. 1098. REG. 1099. 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placed through a broker he is relied upon to prevent a policy lapsing. Another feature of the insurance register is that the accountant is very liable to omit charging off at the end of each month any expired insurance. With the policy-insurance register shown by plate 14, this is held to be impossible, for it automatically catches the expiration of a policy.

As may be noted the register provides a number for the policy, a policy number, date received, classification, key number and amount of the premium. Attention is also called to the fact that the accountant must make a journal voucher each month for expired insurance, and that the current monthly charge-off is arranged at 1-12, 1-24, 1-36, etc. The right side of plate 14 is a small sheet or a "cave" and as many of

these may be used as desired. These "caves" also have space for remarks.

The right and left sides of the combination sales and cost register are shown by plates 15 and 16. In the November issue of the COMMERCIAL CAR JOURNAL plates 4 and 5 were classified as trading accounts and cost of sales respectively, and these are here represented in the combination sales and cost register. For example: New trucks and bodies, control credit 30-120, sales. The total of these columns will be placed to the credit of the control account which represents the entire sale of trucks and bodies for the month or for shorter or longer periods as may be desired. The control column, credit 15-100 and debit 30-120 A, shows the transfer of a sale from the purchase account to the cost of the

sales, leaving only the balance of the stock unsold in account 15-100. The same feature will be shown in the handling of second hand cars, improvements, miscellaneous cars, parts, supplies, repairs, lubricants, etc., also shop labor.

In connection with the sales, attention is specially directed to the feature of showing the gross commission on sales and the manner of treating salesmen's commissions. This in the last column of plate 16 headed "Debit 30-S 2, Credit account 6," and is posted as follows: The commission of each salesman is credited to his individual account in the salesmen division of the accounts receivable ledger. The total of this commission column is charged to expense commissions 30-S-2, and credited to the main control ledger account 6. This shows

10 15 1917 14 11

COST REGISTER 191 SHEET No. _____

10 15 1917 14 11

COMBINATION SALES AND 191 SHEET No. _____

10 15 1917 14 11

GENERAL JOURNAL 191 SHEET No. _____

10 15 1917 14 11

PAY STATEMENT NO. _____

NEWARK N. J.
330 CENTRAL AVE.
ROSTON MASS.
819 BOLLSTON ST.

R. E. TAYLOR CORPORATION
R. E. TAYLOR President
427 WEST 42ND STREET
NEW YORK.

M. _____

ATTACHED YOU WILL FIND OUR CHECK NO. _____
OF THE FOLLOWING ITEMS

DATE OF INVOICE _____

VOUCHER NO. _____

ITEM _____

TOTAL _____

10 15 1917 14 11

Adjusting Entry or Journal Voucher 191

Entry made by _____

Approved _____

Debit _____

Credit _____

10 15 1917 14 11

R. E. TAYLOR CORPORATION
REQUISITION No. 225

TO _____ New York, 191

Purchasing Agent.

Please order the following for _____ DEPARTMENT.

QUANTITY _____ DESCRIPTION _____

Ordered by _____ Req. OK'd by _____

Purchase Order No. _____ Ordered from _____

Charge to Account _____ Date _____ P. A. _____

10 15 1917 14 11

SALES ORDER No. 86

ACCOUNTING DEPT.

SOLD TO _____

ADDRESS _____

MODEL _____

ALLOW FOR _____

BASE OF COMMISSION TO SALESMAN _____

BODY _____

FREIGHT _____

EXTRAS _____

NET SELLING PRICE \$ _____

TOTAL TO BE PAID IN CASH AND NOTES \$ _____

ON DELIVERY \$ _____

BALANCE TO BE PAID IN NOTES \$ _____

CHECKS DRAWN ON _____

SETTLEMENT, DATED _____

NOTES OF \$ _____ EACH \$ _____

NOTES OF \$ _____ EACH \$ _____

NOTES OF \$ _____ EACH \$ _____

TOTAL NUMBER OF NOTES _____

PAYABLE AT _____

INSURANCE \$ _____

EXTRAS CHARGED AS ABOVE _____

WORK TO BE DONE, NO CHARGE. _____

SALESMAN _____

SALES RECORD

COPIED BY _____ PRICED BY _____ SHEET NO. _____

PURCHASE RECORD

COPIED BY _____ PRICED BY _____ SHEET NO. _____

NEW _____

SECOND HAND _____

Plates Nos. 15, 16, 17, 20, 22, 23 and 24

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

the credit side of the salesman account while in the pay roll was shown the debit side. The sales sheets can be utilized for daily posting and can be forwarded from the different branch offices to the home office, or each branch may keep its own books and sheets.

The sales order, shown by plate 17, includes five similarly numbered sheets, these being as follows: Accounting department, white; delivery department, blue; contract department, tan; sales department, pink; —department, green. When a salesman turns in a contract a carbon paper is placed between the sheets above referred to and the details of the sale are typewritten. These include customer's name and address, model and chassis number,

Now it frequently happens that after the salesman has closed a contract, and its details have been entered on the sheets above referred to, that the customer may desire some extra equipment. Or it may be possible that the salesman finds he cannot refuse to give free of charge an accessory, such as an electric horn or some other equipment costing a few dollars. And it may be that the sales manager will O. K. the request of the salesman. Ordinarily the O. K. of the sales manager will result in the horn being installed, but generally the cost is not kept track of in the usual system. In the Wilson system any extra equipment, etc., is automatically caught and noted, for any extra expense must be entered on the delivery department sheet, which finally goes to the accounting depart-

the purchasing agent makes out the purchasing order which is in quintuplet form and of different colors as follows: Original, white; office copy, yellow; receiving department, blue; filing copy, pink; accounting department, light blue. The purchase orders are serially numbered and as a carbon copy is inserted between each sheet, there is no opportunity of alteration without discovery. This method protects the purchasing agent and avoids the possibility of the company receiving substitute goods. The general journal page, plate 22, and which is the same on both sides, requires no explanation.

Plate 23 is the journal voucher and is used to transfer special charges or credits, adjustments, etc. It provides the bookkeeper with means to make a record or entry. Plate 24 is a manifold pay statement and

The image shows three overlapping forms from a financial record-keeping system. The top form is Plate 19, titled 'PURCHASE REGISTER', which is a large grid with columns for 'PAYROLL DISTRIBUTION' and 'PURCHASE SEGREGATION'. Below it is Plate 18, the 'Left Side' of the Purchase Register, which is a continuation of the grid. The bottom form is Plate 12, an 'EXPENSE VOUCHER' numbered 400, which includes fields for date, amount, and description of expense, and a section for 'RECEIVED PAYMENT'.

Plates Nos. 12, 18 and 19

price, if a trade-in, basis of commission to salesman, style of body and price, freight, extras, etc. The list, cost and profit or loss are also indicated in columns. Complete information is given as to insurance, cash and notes, work to be done, etc.; in fact, every detail in connection with the contract is given. On the back of each sheet is printed the word "Memorandum," and the papers are reversed, carbons used, and data as to the time of delivery, changes to be made, instructions, etc., are typewritten. Each of these sheets go to the respective departments, and the comptroller receives his copy. These sheets are, of course, employed at the branches, and the home office receives the delivery sheet.

Any extra expense is charged up as may be noted by reference to plate 6. In this way the comptroller is supplied with facts and figures as to the profits or losses on any particular sale. By this method the comptroller is enabled to check waste as well as in a position to know how much is being spent monthly or annually in extras not paid for.

Plates 18 and 19 are the left and right hand sides of the purchase register and are self-explanatory. In connection with these sheets it should be explained that a requisition sheet, plate 20, must be used by the employees and that the rule is strictly enforced. This requisition sheet is in duplicate and a carbon copy of the order is held until the order is received and checked off. Upon receiving the requisition sheet

is utilized for paying bills only. When accounts are to be settled, bills or statements are not included or sent with the check. A carbon copy is made of the pay statement and, being filed away, enables the comptroller to ascertain easily and quickly the bills paid. Plate 25 illustrates the invoice, and when desired the original is sent to the customer and the duplicate or carbon copy is filed in the sale's binder. Plate 26 refers to the costs of improvements, handling second hand cars, etc.

Referring once more to the initial article of the system, it should be mentioned that account 17, notes receivable in plate No. 2, should read notes payable. Mr. Wilson, the originator of the system, will be pleased to answer any questions relative to its operation.



Motor Truck Design and Construction Made Plain Advantages and Disadvantages of Different Types Discussed

By C. T. SCHAEFER, Member Society Automobile Engineers

This is a series of articles by this well-known writer, covering in a non-technical way, the various constructions now current practice in commercial car design. Preceding articles covered General Types of Chassis, Two and Four-Cycle Engines, Types of Cylinders and Their Parts, The Valve-Operating Mechanism and the Crankcase, Engine Lubrication, The Engine Cooling System, Carburetion and Carburetors, High-Tension Magnetos, Low-Tension Magnetos and Battery Systems, Inductor Magnetos, Governors and Speed-Controlling Devices, Clutches, Unusual Features of Design, Transmissions, The Universal Joint and Differential, The Final Drive, Front and Four-Wheel Drives, Brakes, The Front Axle, The Steering Gear, The Frame, Power Plant Arrangement and Its Mounting, Springs and Suspension, Motor Truck Wheels, The Muffler, The Fuel Supply System, Controls, Tires and Rims.

FUNDAMENTAL PRINCIPLES OF STEERING MECHANISM

Certain Principles That Must be Under- stood in Designing Them

PART XXVII

Some interesting problems pertaining to the design, construction and operation of the modern commercial car are found in the various steering mechanisms employed. Like almost every other important mechanical features, the steering devices now in general use have resulted from a careful study of the conditions to be fulfilled, supplemented by extensive experiments with different types. These researches have resulted in a general steering system which is applied in different forms to all standard commercial vehicles. This, in brief, consists of a hand-wheel, connected through some form of linkage and gearing leverage to the front wheels of the vehicle, these wheels being carried on pivoted ends of the front axle. The design and construction of some of the most important features of this general arrangement afford interesting subjects for discussion.

Throw of Front Wheels

Commercial vehicles must necessarily be operated within a limited space such as a narrow street, and it is of importance that the extreme throw, from side to side of the front wheels be settled upon, as the amount of this throw, together with the wheelbase and tread determines the turning radius. In practice the latter two items are established by the load or body requirements, and with these fixed, the throw of the front wheels is usually limited by the width of the body, frame or springs and the permissible distance between the pivot centers about which the wheels swing. The angles which the connecting linkage make, become too acute or obtuse according to their location, if the maximum throw of the wheels is made more than 35 deg. If this throw is exceeded, steerage is difficult and unsafe.

The theoretical center about which the vehicle turns is somewhat in the center line of the rear axle prolonged, the exact location being determined by the intersection of this line by a line drawn normal to the inside front wheel. Another line drawn from this intersection to the center of the outside front wheel should be normal to this wheel if it is at the correct angle to prevent excessive side slip, which is very destructive to the vehicle tire. The four wheels will describe concentric circles about this theoretical center. This is clearly illustrated in Fig. 1 and it will be noticed that the minimum turning radius is the radius of the arc described by the outer front wheel when these wheels are in the position of maximum throw. The differential device allows the proper relation of speed between the rear wheels.

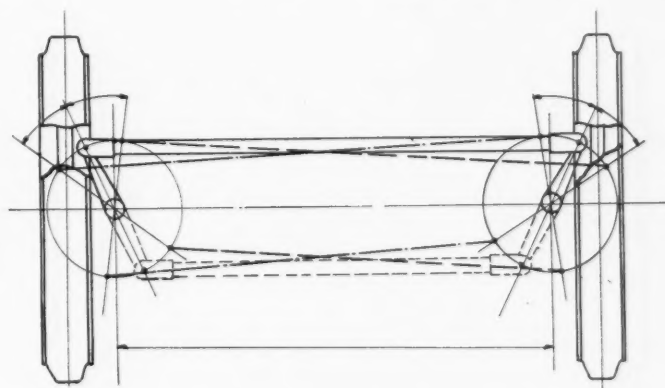
cating the pivot or knuckle levers so that their centers diverge if they project ahead of the axle, and converge if they project back of it. As the wheels swing, the knuckle lever mounted on the spindle of the inner wheel travels away from the dead center arc, thus traveling a smaller angular distance. This is illustrated by heavy lines, Fig. 2, which are shown for both front and rear location of the cross-rod.

Knuckle Lever Angles

There are various methods of theoretically determining the proper angles of these levers, either mathematically or graphically; however, this is largely a matter of compromise, between what is theoretically correct and what is attainable practically. Some makers follow the practice of laying

**Fig. 2. Arrangement
of Knuckle Levers
and Tie Rod for
Front or Rear
Positions**

Front position in full
lines, rear position in
broken lines.



Cross-Rod Locations

As the outer front wheel pivot is turned a smaller angle than the inner is connected, by a cross rod, rigidly attached to it. There must be some compensating device interposed to give the same angular relation when the wheels are turned in the opposite direction. This is accomplished by making use of the principle of varying ratios of sines of the angles at different points in the arcs through which the knuckle levers turn. This necessitates lo-

out these steering connections so that the center line of the knuckle lever extended will intersect the center of the rear axle. Others endeavor to obtain a knuckle lever length and angle, that while fitting into the general layout of the vehicle, gives the largest possible range of steering angle without undue error. This is generally determined more by experience than by any figures. Another point which must be considered in the general layout, is the various lengths of wheelbases and this suggests making the angle of the knuckle levers as

small as possible, consistent with reasonable clearance between the ends of the cross tube and the spokes of the wheels.

Location of Knuckle Levers

Both front and rear positions of these two levers are used and each position possesses its advantages and disadvantages. Some makers prefer the forward location for the reason that it enables large steering angles to be used safely, thus diminishing the turning radius of the vehicle. With the rear position the tie-rod, connecting these two levers, is better protected from injury, providing the proper clearance can be obtained under the engine base. The length of this tie-rod is so adjusted that with the front wheels in the central position the distance apart of the wheel fellos at the height of the spindle is from 3-16 in. to $\frac{5}{8}$ in. less in front of the axle than back of it. The amount of toe-in depends upon the diameter of the wheel, the lower figures being used for wheels 34 in. or less. This toeing-in is intended to allow for slight play in the joints of the tie-rod

on the average. The reasons for these features are that they make steering easier, in that the construction produces a trailer effect which tends to obviate serious consequences in the event of breakage or disconnection of the steering linkage. The point of wheel contact with the ground is behind the point at which the center of the king bolt produced meets the ground, hence the steering wheels trail and are automatically kept in the straight ahead position by the road resistance. This trailer effect somewhat reduces wobbling of the front wheels and also reduces the shock on the steering gear.

Reversibility of Steering Gears

To prevent road shocks from being transmitted to the operator's arms, it is considered best to have the steering gear backlocking, or irreversible to some extent at least. With a perfectly reversible system it is evident road shocks, which are transmitted to the operator's hands, depend on their magnitude and the lever arm through which they act. This system is best adapt-

sible type, which allows the vehicle wheels to be turned independently of any effort exerted on the steering wheel, yet exerting an even resistance to movement. This feature allows the road wheels to follow the path of least resistance and at the same time indicates to the operator the extent and direction of the movement by more or less swerving of the steering wheel depending upon the gear ratio. The semi-re-

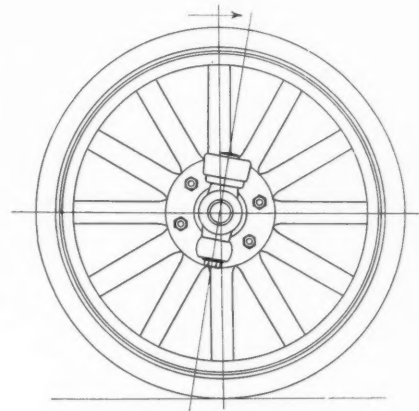


Fig. 3. Trailer Effect When Castor Steering is Approximated by Including King Bolt

versible system also relieves the parts of considerable strain which would be present if the vehicle wheels were rigidly held to their position. A disadvantage of the semi-reversible feature is in steering through sandy or muddy roads and in crossing obstructions such as car tracks, obliquely.

Irreversible Gear for Heavy Service

Heavy service seems to offer a logical field for the irreversible gear as the connection may be made heavy and strong. Considerable manipulation of the steering wheel is usually necessary on these vehicles, which tends to make this type a favorite by relieving the operator of jerks and considerable muscular exertion on the steering wheel. It also permits a very low gear ratio or large hand wheel motion which is quite desirable from the leverage standpoint in operating a heavy vehicle when at a standstill or moving very slowly.

Steering-Gear Ratios

Because a commercial vehicle is heavier and slower than a pleasure car, it necessarily has a different kind of steering gear. Theoretically the layout would be the same for both machines, if they had the same wheelbase, but practically it is necessary to have a greater reduction in the commercial vehicle because it is heavier and naturally takes a greater leverage to turn the wheels; and also, since this vehicle acts at a slower rate of speed, the reduction can again be greater because it is not so necessary to be able to turn the wheels from one side to another quickly.

Owing to the great inertia of a moving loaded commercial vehicle, it is not desirable to make quick turns with the front wheels on account of the tremendous stresses involved by the inertia force and the high center of gravity.

The term, irreversible, in itself, is confusing because it has no exact meaning

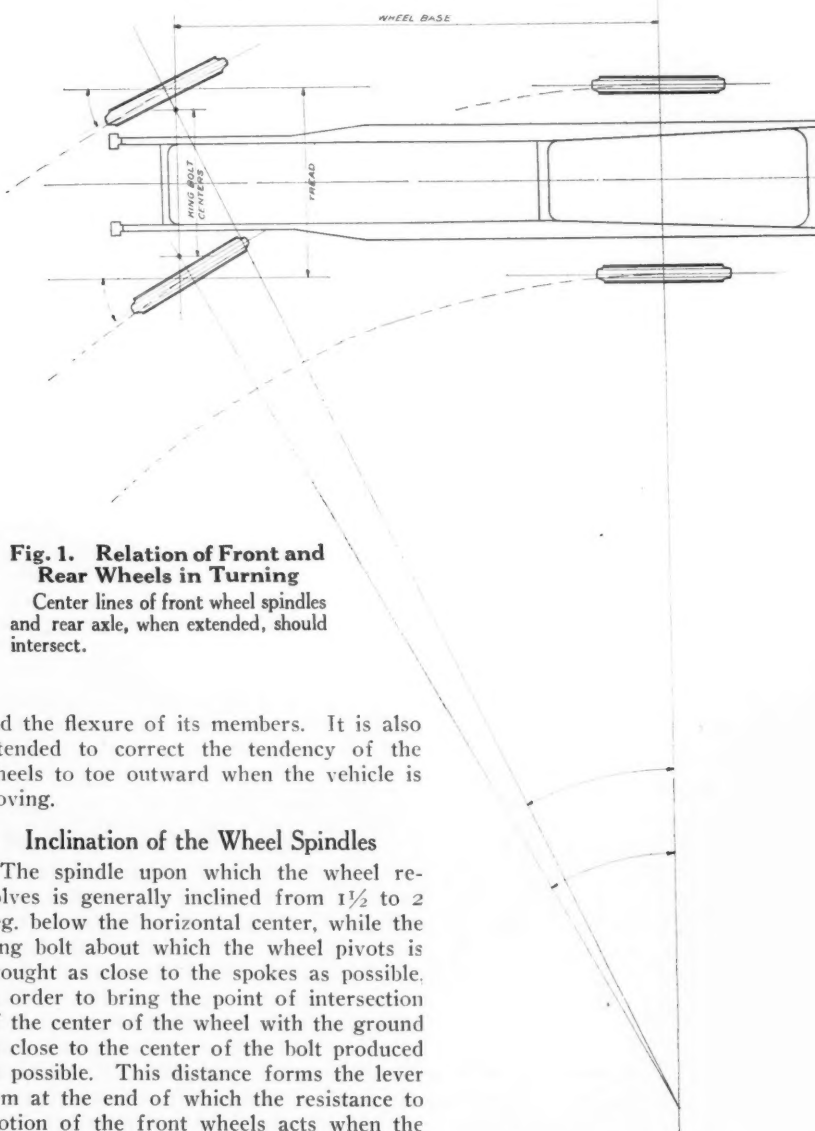


Fig. 1. Relation of Front and Rear Wheels in Turning

Center lines of front wheel spindles and rear axle, when extended, should intersect.

and the flexure of its members. It is also intended to correct the tendency of the wheels to toe outward when the vehicle is moving.

Inclination of the Wheel Spindles

The spindle upon which the wheel revolves is generally inclined from $1\frac{1}{2}$ to 2 deg. below the horizontal center, while the king bolt about which the wheel pivots is brought as close to the spokes as possible, in order to bring the point of intersection of the center of the wheel with the ground as close to the center of the bolt produced as possible. This distance forms the lever arm at the end of which the resistance to motion of the front wheels acts when the wheels swing around for steering.

To approximate castor steering, some manufacturers also incline the axles and king bolt in a fore and aft plane, as in Fig. 3, the inclination being about 4 deg.

ed to show moving vehicles running over smooth pavements, such as the light electric vehicles in common use.

Between the limits of reversible and irreversible steering gears, is the semi-rever-

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

when applied to a steering gear, beyond the rather indefinite condition, that it means that any ordinary road wheel impact will be insufficient to turn the steering wheel. It is simply a question of reduction between the worm and gear or screw and nut, whichever system is used. The greater the reduction the less reversible the system and likewise the slower the motion of the road wheels in relation to the movement of the steering wheel. Hence, the steering mechanism for a heavy vehicle will be less reversible than the steering mechanism for a lighter vehicle.

Tie Rod

The tie rod connects the steering knuckle levers on opposite sides and is usually of tubular section. When placed in front of the axle it ordinarily works under tension, while behind the axle it works under compression. In the forward position the road resistance encountered by the front wheels, acting through the steering knuckles and arms, puts a tension on the rod and in the

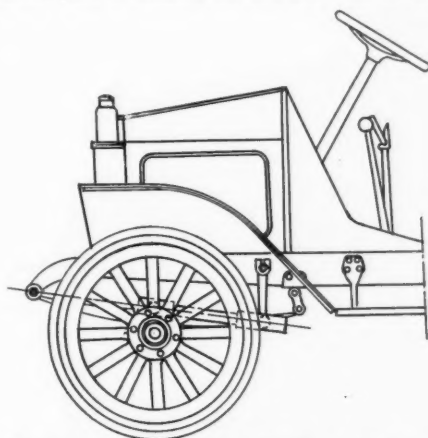


Fig. 4. Steering Gear Back of Axle and Drag Link Parallel With Frame

Center line of drag link produced intersects center of front spring bolt

rear position a compression. The force impressed by the operator in steering the vehicle produces a tension for one direction of motion and a compression for the other, with both constructions.

The ends of the knuckle levers swing in the same plane and the tie rod must be connected with forked connectors. These connectors are generally made adjustable, so that the wheels may be kept properly lined up even if the rod or steering levers become bent slightly. The adjustable connectors must be securely clamped and safe-guarded against working loose.

The Drag Link

The drag link may be placed either in a fore-and-aft position or crosswise of the vehicle. The fore-and-aft position is more generally used when the engine is under a hood, while with the seat over the engine it is difficult to place the gear in such a position as to permit placing the drag link parallel with the frame. The gear usually is so close to the front axle that the drag link must be placed crosswise.

Cushion springs are usually put in the joints of this member to assist in absorbing abrupt shocks which might be transmitted in either direction. These members sometimes are made adjustable for length,

while adjustments are also provided to take up the tension on the springs.

An important point in the steering gear layout is the desirability of a proper geometrical layout for the drag link to avoid front wheel wobble under front spring deflection when the vehicle is in motion. In other words, it is very important to have the drag link so arranged as to produce the least tendency to rotate the steering gear arm as a result of the action of the front springs. When this member is placed crosswise it should be in nearly the same plane as the tie rod under normal load, but with the fore-and-aft position conditions are entirely different. With this arrangement the drag link may be either forward of or behind the front axle. In the latter position, which is the more popular, this link should be so placed that when the truck is loaded, a straight line drawn through the eye of the front spring will approximately intersect both front and rear ball-joint centers of the drag link, as in Fig. 4. A slight deviation from this intersection will not materially affect the results, depending upon the characteristics of the front spring, but the centers must fall approximately on this line to obtain the proper front wheel action under spring deflections, particularly when such spring deflection is at all excessive. To give as nearly as possible true steering under extreme conditions, it is well to make the front springs as flat as possible, to prevent any great extent of forward or backward movement of the axle.

On the Mack model "A. C." trucks, Fig. 5, the steering gear and drag link are ahead of the front axle. This member is slightly out of parallel with the frame, when the mechanism is in mid-position, but swings into position more nearly parallel when the road wheels are turned. The front axle, in its movements, due to road inequalities, swings through an approximate arc about

a point P. The ball on the steering knuckle-arm is as close to this point as conditions permit. The drag link, extending backward, swings about a center L. Thus, both the

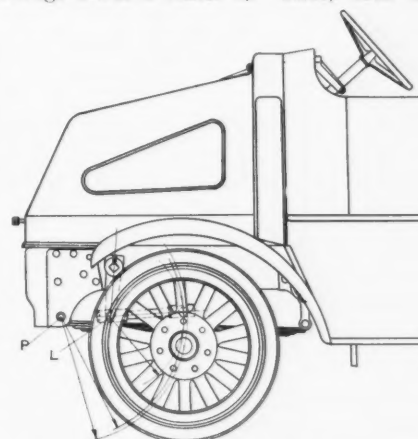


Fig. 5. Mack Model AC Steering-Gear Arrangement

Shows divergence of arc about the front-spring center and the steering-gear arm. The front spring is nearly flat and the steering-gear arm is in front of the axle.

axle itself and the ball on the steering knuckle-arm swing through approximately concentric arcs and no backward or forward motion is imparted to the steering gear arm due to spring deflection.

Conclusion

The problem of steering gear layout involves considerable thought on the part of the designer, particularly regarding the angles of the knuckle levers and the intersection of points produced. The problem is generally a compromise between theory and what is commercially possible. Steering mechanisms, as a whole, are not unsatisfactory, yet an improvement that would tend to make practice coincide more closely with theory would be welcomed.



A View That Shows Many Sides of the War

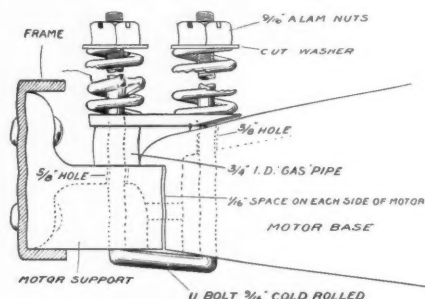
Seldom have the many sides of war come within the compass of the camera as shown here. The illustration shows a French armored motor car near Guient, on the French front. By the roadside are the French and British wounded. Standing by the side of the armored motor are British officers and a chaplain. Back of them is an ambulance. The countryside is torn by shell fire.

Everybody who is anybody in the truck industry reads the CCJ

SPRING SUSPENSION FOR ENGINE AND CAB TOP ON A TRUCK USED ON ROUGH ROADS

By H. E. HUBBARD

WE have out West five trucks built by a Western truck maker, and these are fitted with Continental Model E engines and Brown-Lipe transmissions in unit power plants. These trucks are used for hauling over what are probably

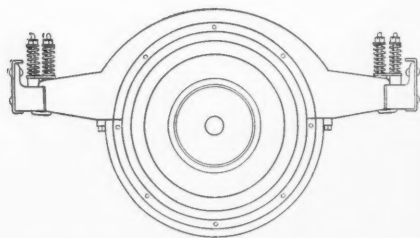


Cross-Section, Showing Engine Support
Showing new spring support. This was formerly solidly bolted at this point

the worst roads in the vicinity of Death Valley.

Up till the time that we worked out and installed this suspension on the engines, one or more of the trucks were laid up all the time waiting for engine bases (upper section of the crankcase) to come from the factory or for the shop men to install them. Since we equipped the trucks with this system we have not had to give them a thought, not even give one of the springs more tension than was originally placed on them.

We drilled $\frac{5}{8}$ in. holes through the engine base legs and through the supports that they rest on. Then we made U-bolts out of 9-16 in. cold rolled stock with S. A. E. threads cut on them.



End View, Showing Both Sides

There are two springs on each side support. The enlarged cross-section shows the details more clearly.

The springs we had wound from $\frac{1}{4}$ in. stock with a 3-16 in. space between windings.

The engines are hung from a cross-member and a swivel block at the front end and were rigidly bolted at the rear by the bolts being run through the engine leg and the leg support. These bolts we took out and discarded.

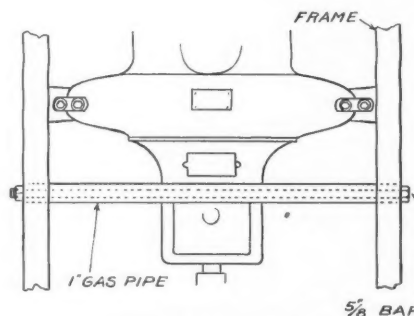
The sketch shows where the bolts were originally placed. And under that system when one wheel on a truck dropped into a chuck hole $1\frac{1}{2}$ or 2 ft. deep something had to give.

A broken leg was usually the result. Now a spring gives for $\frac{1}{2}$ or $\frac{5}{8}$ in., and after the wheel comes up out of the chuck hole the engine is pulled back into place and everything is as before.

Back of the flywheel housing we placed a piece of 1 in. pipe, cut just the right length across the frame and inside the channels, to serve as a spreader to keep the leg supports from pinching the engine in a twist and to keep a small space open between them. Through this pipe and from the outside of the frame we ran a piece of $\frac{5}{8}$ in. cold rolled stock with a nut on each end to keep the pipe in place and to keep the leg supports and the legs from spreading.

The small piece of pipe that rests on the leg support is simply a filler to keep the spring plate fairly level.

The holes in the spring plate are $\frac{5}{8}$ in., as are all the holes through which the



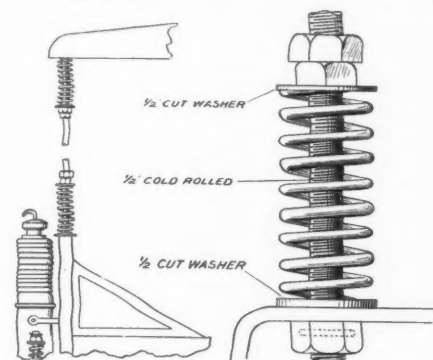
Frame Distance Rod

The gas pipe is used as a filler to hold the frame apart to keep $\frac{1}{16}$ in. distance open on either side of the engine base so as to allow freedom of movement on spring suspension.

U-bolts pass, and the plate itself is made of $1\frac{1}{2} \times \frac{1}{4}$ in. soft steel, slightly beveled at one end to conform to the contour of the engine leg.

The springs are about $3\frac{1}{2}$ in. long and cut washers were used between them and the castellated nuts which regulate their tension and are kept in place by spring cotters.

We found that one turn after the nut was snugly seated on the spring was plenty



Detail of Cab-Top Spring Mounting

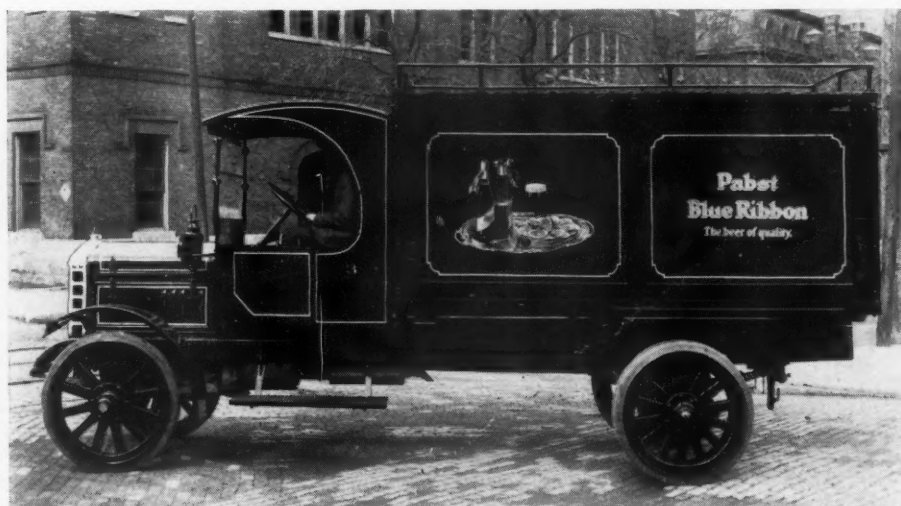
Left side shows the two springs, top and bottom, while the right is an enlarged view

of tension, and since installing this system have had absolute success with it.

The cab tops were supported in the same way, and the sketch is self-explanatory. This also worked out with good success.

LOCOMOBILE CO. OF AMERICA, Bridgeport, Conn., builder of the Riker truck, has increased the price of the 3 and 4-ton models \$100, making the 3-ton model list at \$3600 and the 4-ton at \$3750.

THE BRANFIELD CARBURETOR will be sold exclusively in South America, Australia, New Zealand, Tasmania and South Africa, the Straights Settlements and British India by the J. B. Crockett Co., of New York City.



This Concern Appreciates Value of Truck as an Advertising Medium

One of the most handsomely finished trucks in Milwaukee is that of the Pabst Brewing Company, shown in the accompanying illustration. The body is specially built for the handling of bottled beer, the inside being made up of shelves, which are reached through the two sliding doors on each side. On top is a railing so that empty cases may be carried outside. The real feature of this truck, however, is its finish. The predominating color is a dark blue with the lettering and striping in gold. The picture on the front panel is an unusual bit of work, both in detail and in coloring, and the whole job is set off by a rich red running gear. This is probably the most expensive piece of carriage painting in the city and the owners are willing to spend the money to keep it at the top notch, for it appears each day as clean and highly polished as the most carefully kept limousine. This is but one of forty Sterling trucks of different types which the Pabst Company has in operation throughout the country.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

Why Motor Trucks Should Replace One-Horse Wagons

Horse-Drawn Equipments Occupy Twice the Space the Average Truck Takes Up. Twenty-five Miles Per Day the Horse's Limit.

By GEORGE W. GRUPP

IF one happens to live in Greater New York, or if one is familiar with the actual conditions which prevail, one knows that its space is immensely valuable. The congestion on the streets is intense. Only a small amount of space for delivery vehicle storage is within the reach of the small merchant's rental pocketbook.

These facts are especially important to the man whose business does not exceed that of a one-horse delivery service. Besides, no single horse wagon has ever averaged more than 17 miles a day without giving undue amount of depreciation to the equipment. If an average of 25 miles a day is to be covered, the merchant should have two horses for his wagon if he wishes to overcome this undue depreciation.

Horse Equipment Occupies More Space

Further, at least 128 sq. ft. must be given over for the storage of each wagon, 32 sq. ft. for each horse, and an additional stall, very much larger, is necessary where the horse and harness should be cleaned, and also a place for the washing of the wagon, and a storage place for harness, feed and shavings or straw must be provided.

On the other hand, a small electric or gasoline truck with an equivalent carrying capacity would only occupy about 60 sq. ft., this depending on the make of car. Therefore, a room with but 126 sq. ft., which is less than the space actually occupied by a delivery wagon, would be sufficiently large to store, repair and clean the truck. All of this means much rent and cost of upkeep may be saved by replacing the one-horse vehicle with a truck.

More than that, when a horse-driven vehicle is backed up against the door of the

merchant, and over and on the sidewalk, the pedestrians are compelled to get off the sidewalk and walk around. This would not be so if a small truck were used, because a horse and wagon occupy 17 ft. over all, while a motor truck is only 11 ft. over all.

At the moment it might be well to cite the experiences of a few local concerns. C. Perceval, Inc., of 9th Ave., New York City, which does a table delicacies business and operates three Ward deliveries and a 1-ton G. M. C., has replaced its horse-driven vehicles with profit, as they are now able to get around more rapidly, and able to economize, in that they are now able to store and wash their vehicles on their own premises.

Trucks Cost No More

"Our cost of upkeep," began E. S. Parker of the Perceval, Inc., "is pretty near the cost of our single horse rigs, with of course a far greater mileage per day."

"The chauffeurs," he continued, "take a far greater interest in the cars, than in the horses, which are directly under their supervision, and which any merchant will understand means considerable with any piece of machinery, and particularly with a truck.

"We are charging the cars with a simple outfit, and without anyone on the premises to attend to them at night. Therefore it will be seen that the usual expenses are considerably lowered, as there is no increase in insurance on the building for electric

cars, etc. Our cars run 66 miles on a single charge.

Small Cars Satisfactory

"Formerly we had larger cars on our delivery routes, and while it is true they were unsatisfactory and very expensive for the work they were required to do, we do not blame the cars so much as our own lack of experience.

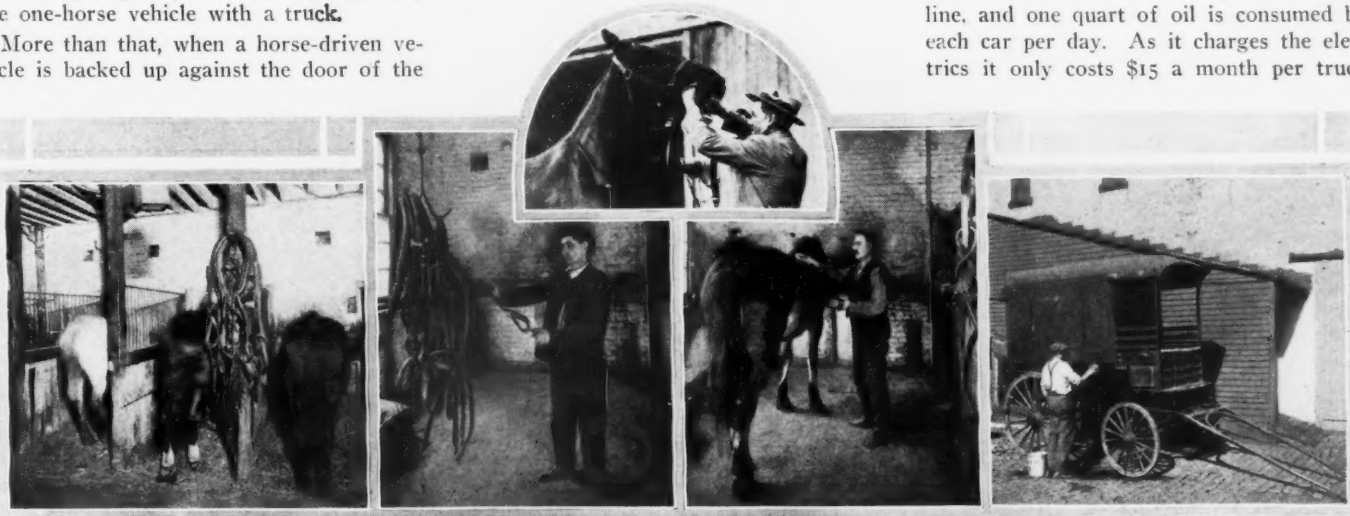
"We think, he added, there must be many concerns using large cars where small ones would do the work, and be much more economical. At any rate our experience has cost us considerable and we are willing to pass it along."

He concluded his remarks by saying—"The question of simplicity of operation of an electric needs no explanations. This has made it easy for us to use horse drivers, who naturally are far better for us than hiring new men, as they know the routes and will take better care of the cars."

The Wright Cake Co., of N. First St., Brooklyn, which operates a fleet of ten Fords, 3 Wards and four G. V. T.'s, has been able to save 1925 sq. ft. of vehicle storage space by replacing their horse-driven vehicles for motor trucks.

Truck's Cost of Upkeep is One-Half

This firm's Fords run on the average of 50 miles a day, and the electrics average 35 miles. One of the Ford trucks goes to South River and return, a run of 135 miles a day. And with all this hard usage their cost of operating is not great. It is able to get 20 miles out of a gallon of gasoline, and one quart of oil is consumed by each car per day. As it charges the electrics it only costs \$15 a month per truck



The Horse and His Boarding House Take Up Entirely Too Much Room

Each horse requires 32 square feet for a stall. A small delivery would have ample room in the space occupied by the three horses. And next comes the space to groom the animal and clean the harness. As wagons cannot, as a rule, be washed in the stable, another place must be found where this may be done. Ever so often the horse's health must be thoroughly gone over. And he keeps right on eating whether working or not. Further comments are unnecessary. The logical solution is the light delivery motor-driven vehicle.

Merit wins—that's why the CCJ is the leader

for current. Further, it only costs on an average of \$16.50 a month per Ford car for gasoline and oil.

In comparison, when horses were used, the cost of upkeep was considerably more. By actual experience it was found that it cost them, per horse, \$30 a month for feed alone. This, as one can see, is nearly twice the cost of fuel for a single truck.

Further, the cost of repairs has been small. One of the Ford cars, which has

been in continuous operation since March, 1915, has only cost \$3 in repairs

Will Never Return to Horses

"We will never return to the horse delivery service," said F. W. Houston, of the Wright Cake Co. "And our reasons for this conclusion are because a truck is cheaper, swifter and better than a horse-driven vehicle. We can cover more ter-

ritory, and when a truck breaks an axle it can always be replaced or repaired, but when a horse breaks a leg he must be shot, which of course means a total loss."

In conclusion, the very interesting pictures which accompany this article, and which were taken by the New York Edison Co., graphically describe that the motor truck is more economical, and that it is replacing the one-horse vehicle with profit.



Just for the Sake of Comparison

Note the space taken up by the single-horse team, and then note how very little additional space is required for the three delivery cars

FUEL RESTRICTIONS IN GREAT BRITAIN

Town Gas for Commercial Cars

The restrictions on the use of gasoline in Great Britain are regarded by many mainly as a political move, firstly to please the labor party who have a tendency to regard all automobilists as greedy plutocrats, secondly to conserve labor. This last is probably the more real reason, but, however that may be, the restrictions are making themselves felt in the commercial car business over here, as their principle has also been applied to all public service vehicles engaged on tourist or other work.

As usual the law on the matter has been framed by lawyers, (there are over 140 in the British Parliament), for lawyers rather than for the public, and the law, which presumably should define what may and may not be done, has been made conveniently indefinite on the subject. Thus certain resourceful firms that to avoid the use of gasoline used kerosene for their observation cars, have been fined by the local solons, and as no government department will take the responsibility of defining the indeterminate wording of the lawyers, an appeal has been lodged against the verdict, to the profit of the legal profession.

But British commercial car users have not been content merely to use kerosene as a substitute for gasoline, for experiments have been carried out in Glasgow, with the use of town gas, by Richard Liggett, secretary of the Foremen's Association of the Corporation Gas Department. By removing the petrol jet from the carburetor and inserting a grill injector by

means of a plate screwed to the flange seat of the petrol jet, he attained sufficient success by using the throttle in the ordinary way to encourage him to devise a special controller. This was tried on several different engines, including a 16 h.p. Albion and a 25 h.p. Halley. As a result of these experiments Mr. Liggett has also ascertained that the consumption of gas aver-

aged about 160 cu. ft. an hour, which at 56 cents per 1000 cu. ft. works out, roughly speaking, to a cost of \$.09 per hour. As the net results of these investigations, their author concludes that, while gasoline has the advantage of being storable in a very small tank, gas can prove a strong competitor to both electricity or gasoline for short distance or town work.



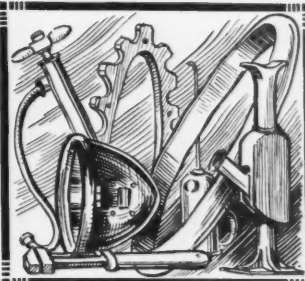
The Trench Grocery Shop

To save the soldiers against the enormous charges of the merchants at the front, the commanding staff has organized movable stores which sell direct to the soldiers. The little things which are indispensable can be purchased from these traveling motor cars.

The CCJ is built upon the lasting foundation of honest circulation



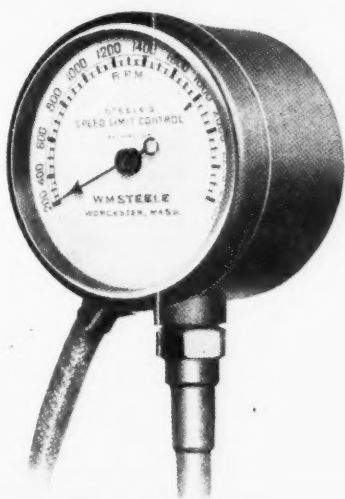
TRUCK ACCESSORIES AND APPLIANCES



STEELE'S SPEED-LIMIT CONTROL

W. M. Steele, 98-100 Bacon Street, Worcester, Mass., is putting out an improved speed limit controlling device which is designed to automatically prevent the revolutions per minute of an engine rising above a certain predetermined point. This is accomplished by cutting out the spark at the desired point. The engine fails to fire at this point and can not run any faster. The maker claims that this is done without interfering in any way with the operator's control of the gas supply or power available.

The device consists of an accurately calibrated dead beat tachometer of the re-



Steele's Speed-Limit Control

This instrument does not interfere with the operator's control of the engine, except that of maximum speed.

liable centrifugal fly ball type, mounted on the dashboard in full view of the operator. It has a clear enameled dial graduated to read in revolutions per minute of the engine. This dial is protected by a clear bevel plate glass; its case is of durable and attractive gun metal finish.

The drive for this tachometer is obtained from a flexible shaft and positive gear connection to the engine, preferably on the magneto shaft. This flexible shaft consists of a strong, close wound 16-strand coil of music wire enclosed in a strong dustproof flexible tube. The gears are hardened steel spirals running in lubricating grease.

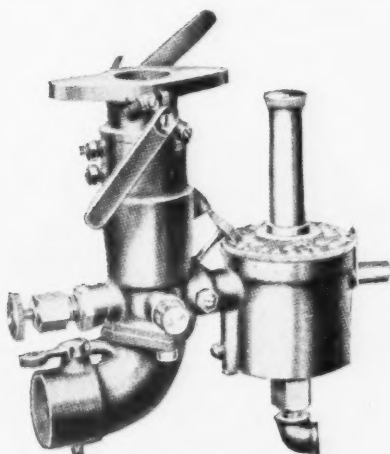
The construction of the control feature is said to be very simple. Within the tachometer are two platinum buttons, which can be adjusted to make contacts at any

desired number of revolutions per minute of the engine and should be set to give the maximum speed in miles per hour desired when transmission is in high speed. When this contact is made the wire leading to the primary circuit of the ignition system is grounded. The engine ceases to fire until contact is broken, which occurs immediately the engine speed drops 2 to 5 r.p.m.

The Steele speed limit control sells for \$75 applied.

THE MY-CUE CARBURETOR

The My-Cue Engineering and Machine Works, Niagara Falls, N. Y., is offering the My-Cue Carburetor for cars of all makes. This instrument is claimed to save from 15 to 40 per cent. in gasoline, insuring a smoother running and more powerful engine, also a saving on the general wear and tear of the machinery due to a more perfect acceleration and a better mixture of various changes in engine speeds. The basis for these claims is centered in the long flaring mixing chamber and long stroke governor valve. As the engine speed increases the valves lift further off the seat, increasing the air space between the



The My-Cue Carburetor

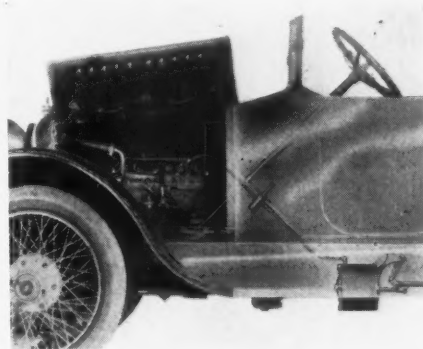
This instrument is claimed to be thoroughly economical and reliable. After all adjustments are set it is said to require no further attention, as the atmospheric pressure remains the same all year round.

governor valve and chamber wall, increasing the volume of air and gasoline in the engine. The adjustments are simple and include one low speed needle valve to adjust for slow running engine, one high speed needle valve to adjust for fast running engine, and float adjustment which is accurately adjusted for general service at the factory. My-Cue Carburetors are priced from \$15.50 to \$37.

THE PREST-O-VACUUM BRAKE

That the vacuum or suction force which lifts fuel from the carburetor, can be put to useful work, has been quite well demonstrated in the vacuum gasoline feed. That the same force can be made to do other work requires no stretch of the imagination. The latest application of this principle is the Prest-O-Vacuum Brake, the product of the Prest-O-Lite Co., Inc., of Indianapolis, Ind.

Briefly, the device may be described in the term "self-stopper." The suction of the intake manifold is utilized to apply either slight or tremendous pressure, as desired, at the rear wheels, by the mere



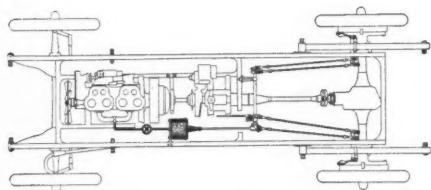
Phantom View of Car Equipped With the Brake

This illustrates the foot-control installation of the Prest-O-Vacuum brake. When hand control is provided, a hand lever is placed on the steering column instead of the button on the toeboard.

touch of the foot or finger. While the idea of "let the engine do the work" is not a new one in the story of motor car improvement, in this instance an additional advantage prevails, because the engine receives no additional burden and only does the work at moments when it is not seriously engaged in propelling the car. The force of suction exists whenever the engine is turning over, and whether this force is exerted against the walls of the intake manifold and carburetor, or whether it be allowed to draw also against a brake piston, would seem to involve no engineering complications.

When the engine of the car is running, the vacuum in the intake manifold exerts a suction force equal to approximately 10 lbs. pressure to the square inch. By employing this suction to move forward a piston in a small special cylinder, and employing a simple lever to connect with the brake rod, the force of 10 lbs. pressure to the square inch at the intake manifold may be translated, through leverage, into 1000

lbs. pull at the rear wheels. By providing a much more powerful braking force than is found in the arm or leg of the driver, even when assisted by the best permissible principles of leverage, it is readily conceivable that a more positive application of the brakes could be insured. It is claimed for the Prest-O-Vacuum Brake that the vacuum principle accomplishes this very thing, and that the lack of constantly perfect brake adjustment, which is now somewhat of a bug-a-boo to the motorist, ceases to be a serious matter, because the abundant power available will exert the necessary pull to apply the brake band to the brake drum. Furthermore, if the brakes were somewhat unequally adjusted at the



Plan View of Chassis

This shows how the Prest-O-Vacuum brake is applied to the average chassis. The foot or service brake may be retained if desired.

rear wheels so that 350 lbs. pull would suffice to lock one wheel, but 500 lbs. pull readily be seen that a pull of 1000 lbs. would lock them both.

The instantaneous and powerful application of the brake in tight places and relieving the driver from muscular effort under any conditions, by the employment of engine power, are points relied upon to make the device not only attractive to male drivers but doubly attractive to women. Operating the service brake by foot pressure, particularly at frequent intervals in traffic, at the very least, calls for an amount of physical effort from which the motorist would presumably be glad to be relieved. Keeping the brake applied in descending a long steep hill frequently calls for a long continued use of leg muscle, which even the strongest and most expert drivers would be glad to avoid.

The mechanism of the Prest-O-Vacuum Brake is a cylinder weighing 12 lbs. and containing a leather-faced piston, a lever for connecting to the brake rod, a small controlling valve, and the necessary copper tubing to connect from the intake manifold to the valve, and from there to the vacuum cylinder. It will be seen, therefore, that the device is accurately described as a "vacuum brake." Although it employs the same sort of cylinder and the same sort of leather-faced piston used on railway car and street car brakes, it is not a pneumatic air brake; there is no air compressor and no air storage tank. By opening a valve the suction of the engine itself draws forward the piston in the special cylinder and applies the brake. The only exertion on the part of the driver is in opening the controlling valve by moving a lever on the steering column or pressing on a foot control, precisely as he now controls the speed of his engine by a foot accelerator or throttle lever. The release of the vacuum

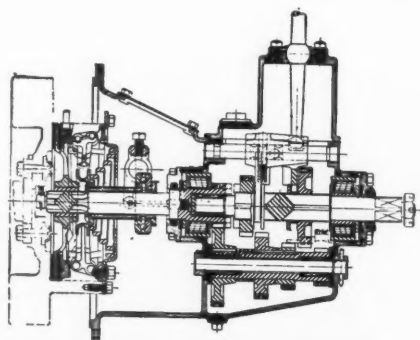
brake is accomplished by spring action. In fact, the action, both on application and release, may be fitly compared to the present manipulation of a foot throttle or accelerator—a slight pressure is sufficient for operation, and when that pressure is released, spring action brings the device back to normal position.

Since the vacuum brake is operative only when the engine is turning over, it is applicable only to the foot or service brake, the hand or emergency brake still being necessary when it is desired to leave the car standing idle on a grade.

The controlling valve is a simple two-way valve, which when opened allows the suction of the engine to operate to any desired extent in the vacuum cylinder, and when closed allows air to rush into the vacuum cylinder, releasing the brake. The valve is so designed that the brake may be applied very slightly or may be applied instantly to the full extent so as to lock the wheels, or may be applied or released to any degree between those two extremes, at the will of the operator.

COVERT MODEL "L" TRANSMISSION

The New Covert Model "L" transmission, suitable for pleasure cars and light trucks of unit power plant type, while in general following closely the design of previous models, has many refinements in details. The gears are of generous proportions and capable of standing up under all conditions of service. Stub teeth with a



Covert Model L Transmission

This model reveals scientific refinement of detail with the basic principles of Covert design retained. The standard bell housing for this size transmission is the No. 4 S. A. E. Suitable arrangements have also been made for engines not carrying the S. A. E. standard flanges.

pitch of 7-9 in. and $\frac{3}{4}$ in. face are used. The speed reduction on first speed is unusually low, being 3.61 to 1, and giving a tremendous amount of reserve power for emergency purposes. Special nickel steel is used in making forgings for these gears, and after the teeth are cut and other finishing operations performed, they are heat-treated, then subjected to a careful test for correct hardness, as a check on the heat treatment. The next step is careful grinding of gears, after which they are mounted on a shaft and given a rigid inspection in which the pitch line of the gears is carefully checked up.

The shafts are of alloy steel and the same care is exercised in the heat treating,

grinding and inspection of these as is the case with the gears. The main drive shaft is square in section with a mean diameter of $1\frac{1}{4}$ in., making it strong and enabling gears to run under load without appreciable deflection of shaft. The lay shaft, which is hollow and has the reverse pinion integral with it, runs on two solid steel roller bearings mounted on a pin passing through the hollow lay shaft and supported in suitable bosses at either end of transmission case. The reverse idler is mounted on a Hyatt bearing, as is also the forward end of the square main drive shaft. The rear end of this shaft, however, is mounted on a double row ball bearing, so installed as to take thrust in either direction. The driving pinion is integral with the clutch shaft and provided with a flexible roller bearing at the rear end and a suitable bearing in the flywheel forward.

The control set, of an improved type, has the gear shift lever mounted on the cover of the gear box and operates on a ball joint. To one side, also mounted entirely on the gear case cover, is the emergency brake lever together with locking ratchet. The short arm of emergency brake lever is a separate piece and is bent at the top at right angles, forming the brake lever shaft, and the bosses carrying this shaft, being attached to the cover, all bosses on the transmission case in connection with this lever, are eliminated, making a clean and simple construction. In case a transmission brake is used, this construction is very quickly adapted by making a bell crank at 90 deg. of the lever which throws the brake pull rod eye in the correct position for a transmission brake.

Shifting of Gears

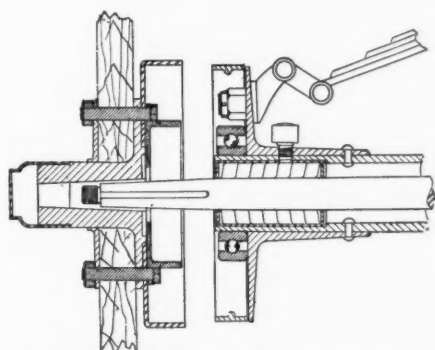
The shifting of gears is brought about by means of two drop forged yokes, separated by a steel shifting rail, sliding on hardened and ground shafts, which in turn are locked in the case. These forged yokes are locked in neutral position by a hardened steel ball so held in position by the shifting rail that only one yoke can be shifted at a time. The gear is locked in its shifted position by means of a steel ball which engages both the yoke and the shaft, and is held in position by a coil spring of suitable dimension to hold this gear in place, at the same time not to make shifting too difficult. The clutch in connection with this transmission is of the floating ring type and carries a steel disc which is free to slide axially on the transmission shaft, together with two Raybestos fibre rings, one of which takes up the friction between the floating ring and the steel plate, when a sliding hub actuating the arms is pressed in position by means of a coil spring.

Owing to the leverage on the arms, a very small amount of pressure on the clutch pedal will release the clutch; yet, at the same time, when the arms are pressed in the driving position by means of the coil spring, they furnish a positive lock between the transmission and driving unit.

This transmission is made by the Covert Gear Co., Inc., Detroit, Mich.

HERCULES AUXILIARY BEARINGS

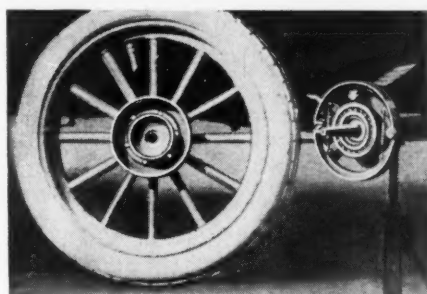
The Hercules Auxiliary Bearing Works, 327 La Salle Street, Chicago, Ill., is placing on the market a new device known as the Hercules auxiliary bearings for increasing the carrying capacity of the Ford car. These bearings consist of two high duty type, combined radial and thrust bearings, capable of carrying a load of 3800 lbs. at axle speed. They are mounted on the outer ends of the Ford rear axle housing and engage a steel bracket which is fitted to the inside of the brake drums. These brackets are held in place by means of six special bolts, to be used in place of the bolts regularly furnished with the Ford wheels used



Sectional View of the Ford Wheel and Axle Assembly

Showing the Hercules bearing in position. It is said that these bearings may be installed without machine work or change in the Ford wheel and axle construction.

for bolting the brake drum and hub flanges to the wheels. When the wheels are in place on the axle shafts the steel bracket contained in the brake drum engages the auxiliary bearing on its outer race, thus carrying the entire weight and load on the



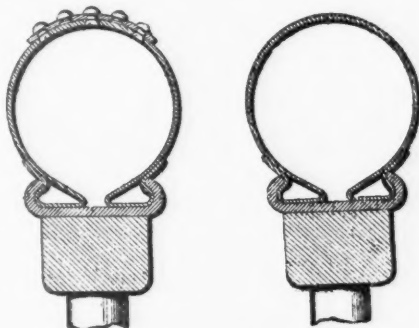
Ford Wheel Removed Showing the Hercules Auxiliary Bearing

This bearing is designed to increase the carrying capacity of the Ford car by removing the load from the axle shafts.

axle housing and wheels, bringing the auxiliary bearings $1\frac{1}{4}$ in. from the center of the wheel. The maker claims that by use of the Hercules bearings all weight of the car and load is removed from the axle shafts and provides for a much greater carrying capacity of the car. The device is additionally claimed to permit of the use of solid tires or demountable rims without danger of bending the axle shafts.

NEW PUNCTURE-PROOF TIRE

The Winston Tire & Repair Co., 502 N. Main Street, Winston-Salem, N. C., have been granted a patent on a puncture-proof tire for all types of automobiles. The in-



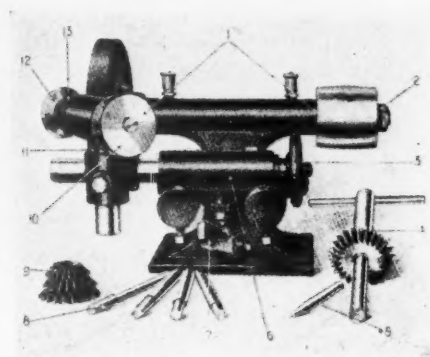
New Puncture-Proof Tire

Sectional view of the tire, showing the tread with and without the leather reinforcement. The maker claims this tire to be resilient and puncture proof.

vention appears to be new in principle and is claimed to provide a tire capable of attachment to the ordinary forms of rims and made of sheet metal, properly shaped to resist the crushing strains imposed by varied road conditions. The tire is said to be sufficiently resilient to counteract the shocks and jars and preventing them from being transmitted to the wheel. The sheet metal is bent into cylindrical form with a split on the inner side. The tire is provided on each side of the split with a rib, designed to engage on the inner flanges of the rim which is supported on the wheel. The tread is provided with a strip of leather to reinforce the tire. This strip is held in place by suitable rivets with heads shaped to fit the tapered openings.

NASCO VALVE GRINDER

The National Auto Specialty Mfg. Co., Tama, Iowa, is offering the Nasco Valve Grinder for grinding all types of steel



The Nasco Valve Grinder

This machine is said to be capable of grinding all kinds of automobile engine valves with ease, imparting a glasslike finish to the ground surface.

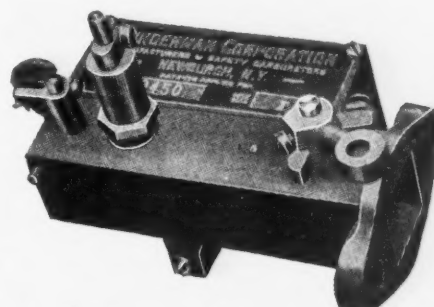
valves. This tool is made up of a grinder stand with a 5 in. wheel, complete with all attachments, such as a reamer handle, five pilots and four reamers. The maker claims that the Nasco will grind any automobile

engine valves regardless of their size or the material from which they are made and at any angle desired. One of the features is the speed and ease with which the various valves are accurately ground. Price of complete set, \$30.

WHITE STAR EXTRA QUALITY MOTOR OIL

The White Star Refining Co., of Detroit, is offering White Star Extra Quality Motor Oil which is the result of more than three years of research and effort to produce an efficient lubricant for gasoline engines. Since the advent of the automobile one of the greatest problems engineers had to solve was that of engine lubrication. Every year brings forth improvements in cars and their oiling systems, but the biggest difficulty has proved to be not one of system, but rather one of producing an oil that would stand up under great heat and thoroughly lubricate all moving parts. White Star Oil is made from crude oil, obtained from selected oil fields and is claimed to have an extremely high heat test.

Wax is one of the necessary evils to be found in large quantities in crude oil and most of this must be squeezed out to produce an oil that will lubricate under heat as well as flow freely when cold. A feature of the White Star oil is the low cold test claimed by the maker. Particular attention is called to the fact that this oil is used by the Ford Motor Co. in its plants and branches.



Sunderman Carburetor Shows Further Improvements

The above illustration shows the latest improved Sunderman vacuum carburetor, which is now selling for \$5. It will be observed that the position of the throttle and priming device has been changed, and this, coupled with the redesigned body, lends a more compact appearance to the assembly. These latest improvements are claimed to permit idling of the engine without causing load, allow instantaneous acceleration without a sign of load or hitch, and to effect a considerable decrease in gasoline consumption.

This device is made by the Sunderman Corporation, Newburgh, N. Y.

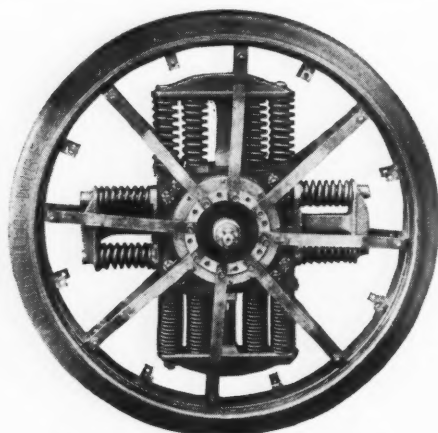
BOSCH MAGNETO Co., New York City, has announced that the following concerns in the commercial car field have closed contracts to use the Bosch magneto for the coming season:

Independent Auto Truck Co., Davenport, Ia.; Lewis-Hall Iron Works, Detroit, Mich.; Hahn Motor Truck & Wagon Co., Hamburg, Pa.; Available Truck Co., Chicago, Ill.; Durable Dayton Truck Co., Dayton, Ohio; Twin City Four Wheel Drive Co., St. Paul, Minn.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

THE CORNFIELD RESILIENT WHEEL

The Cornfield Resilient Wheel Co., New York American Bldg., 58th and Broadway, New York City, is manufacturing a new shock absorbing wheel for pleasure and commercial cars. This wheel is fitted with a solid rubber tire and weighs a trifle more than the ordinary pleasure car wheel. Referring to the more detailed particulars the four hub guide arms form one piece and the hub itself is keyed to the shaft or shaft housing, depending on the style of drive. This construction maintains the guide arms and square center at right angles as they are connected as follows:



The Cornfield Resilient Wheel

Particular attention is directed to the action of the upper springs when in operation. Their action is claimed to be substantially the same as a pneumatic tire, duplicating the rapid action required to absorb all the little road shocks and jolts.

On the four sides of the square center are placed sliding washers, which fit around the guide arms. The coil springs are placed on the washers and under the cross beams, being forced down under tension. The guide arms work between and bear against each side of the square center, which keep the floating hub, guide arms, cross beams, springs and square center rigidly at right angles at all times, thus allowing for only horizontal and vertical deflection of the springs preventing any torsion or side thrust on the springs. The spring action, considered in detail, reveals the fact that the top springs are intended to carry the load, the bottom springs to take the recoil; similarly, when the clutch is thrown in the horizontal front springs compress, taking practically all the shock. On the other hand, when the brake is sharply applied, all the shock is said to be absorbed by the horizontal back springs.

Sudden resistance or shocks received on the tires and delivered to the springs cause the housing to move in a vertical or horizontal direction, causing temporary eccentricity. These changes will favor over riding obstacles, as the housing can cross the center line of the floating hub. The revolving portion of the wheel consists only of the tire and side plates, hence the bulk of the weight is stationary and not gyroscopic, favoring easy riding much the same as the ballasted floor of a Pullman car. In the drive wheel for internal gear and chain,

and for live shafts, there is provided a universal joint that drives the wheel so that the housing can deflect while turning. The drive is similar to a locomotive drive with the following exception: Where in the latter the drive pin bearing is rigidly fixed, in this drive there is a slot with a ring flat on two sides that fits in the slot without any play, but can slide up and down. The pin fits in the ring, therefore the ring can slide up and down and at the same time the pin can turn in the ring, thereby allowing the springs to deflect as the wheel turns.

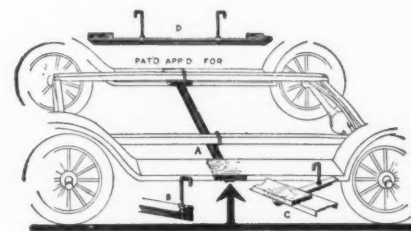
MAKE-A-MOTOR-TRUCK

The Make-A-Motor Truck Co., 1508 Michigan Ave., Chicago, Ill., is putting out an internally gear-driven device, designed to convert the Ford chassis into a one-ton truck. This device utilizes the Ford rear axle assembly intact. A spline extension is placed in the driving shaft just back of the transmission carrying another universal joint, and all are supported on a cross member in the frame. The maker states that more of the original Ford car is used than is usual, there being only the rear spring, rear frame member and front wheels discarded. The rear wheels, with their $3\frac{1}{2}$ in. tires, are placed on the front salvaging the front tires and wheels. The cast steel rear wheel is driven by internal spur gears which in turn are attached to the end of the Ford rear axle exactly as the Ford rear wheels were originally attached. All the gearing is enclosed, making possible the lubrication thereof for five thousand miles at one filling. Bearings used are the S. K. F. self-aligning double row ball type designed for 100 per cent. overload. This self-aligning feature is said to be valuable when the truck is in the hands of a careless driver, as a bent axle or wheel knocked out of line will not put the device out of commission. Specifications for the attachment include a 4 in. rolled steel channel frame, 168 in. long and 32 in. wide; semi-elliptic chrome electric silico manganese steel springs of the Titanic type carry the rear; axle, $2\frac{1}{2}$ x 2 in. high carbon, heat treated, ground and polished; wheels, patented, made of electric steel, in one piece; gears, steel involute, machine cut teeth running in grease; brakes, the

Ford emergency is used as in passenger service on the Ford axle. More efficiency is provided through the gear reduction. Spring hangers, crucible cast steel, accurately machined; spring clips, crucible steel, accurately machined and fitted to axle and springs; tires, $32 \times 3\frac{1}{2}$ in., solid tires, any standard make, are used on rear wheels. The price of the Make-A-Truck attachment is \$350.

DOW BODY BRACE

The Dow Wire & Iron Works, Louisville, Ky., is putting out a new accessory for Ford cars, known as the Dow body brace. This device is described as being a strong

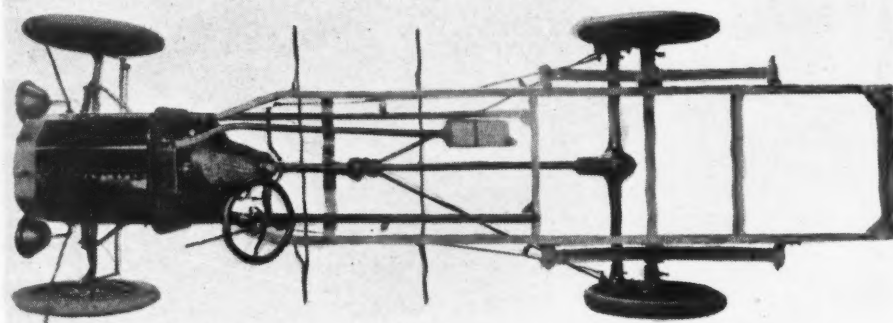


Dow Body Brace

The above illustration shows clearly how the bracer is attached to the frame of a Ford car. Details such as hooks fitted to the angle piece, etc., may also be noted.

steel angle brace, fitted with hook bolts and suitable wood blocks. The steel angle brace is carried transversely below the frame and running boards by means of the hook bolts which hook over the main frame members. The wood blocks at either end of the steel angle brace fit snugly under the running boards and provide additional support for these parts. The maker claims these braces to be efficient body braces, relieving the springs of uneven loading and causing the car to ride much easier. Dow body braces may be readily attached and weigh but 12 lbs. The price is \$2.50.

THE LASALLE HOTEL, of Chicago, Ill., the only hotel owning and operating its own taxicab service in the United States, has just closed a contract with the Willys-Overland Co., of Toledo, O., for the installation of 50 Willys-Knight taxicabs.



The Make-A-Motor-Truck

Top view of a converted Ford chassis, showing the essentials of the Make-A-Truck unit. The company claims the device to be free from adjustments, as there are no internal brakes, nuts, spring bolts, rivets, cotter keys, cams or bell cranks to work loose.

Advertising appropriations bring greatest returns when expended in the CCJ

New Apparatus Vaporizes Kerosene Satisfactorily

Electrically Operated Starting Burner Permits Starting Cold Engine in Ten Seconds With Kerosene. Standard Type Gasoline Carburetor Used

By C. P. SHATTUCK

VARIOUS attempts have been made to utilize kerosene as a fuel for the standard gasoline engine, but the efforts have not been attended with success nor have they proved satisfactory with the variable load, variable speed multi-cylinder internal combustion engine. In other words, devices obtaining satisfactory results with the stationary engine operating at practically a fixed speed and load are not adaptable to the automobile engine owing to the variable temperature of the engine and to mixtures of a variable degree of vaporization particularly noticeable with variations of the throttle, speed or load. Aside from the difficulty experienced in starting with kerosene there is that of obtaining a dry, homogeneous mixture, especially at low or idling engine speeds where a wet or incompletely vaporized product carrying particles of unvaporized fuel result in smoke and a very objectionable odor in the exhaust as well as invites carbon deposits. The methods obtaining with farm tractors or the injection of water to carry sufficient compression to obtain high mean effective pressure and thermal efficiency, are not suited to the automobile engine because of their bulkiness and time required for starting.

The development and what may be termed the perfection of a vaporizer that permits of the use of kerosene for starting as well as operation, the use of any standard type of gasoline carburetor, and with which it is possible to start the engine from cold in practically the same time as is required with the conventional fuel, has been accomplished by John Good of the

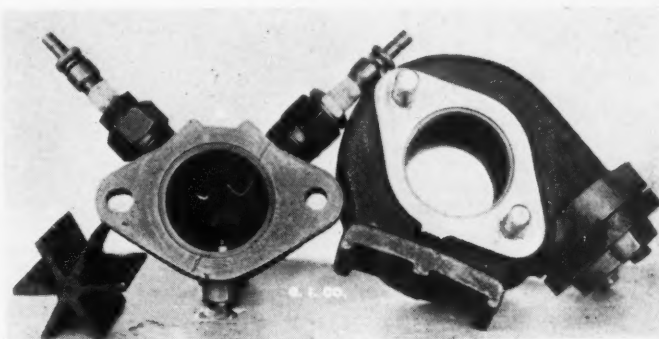
Good Inventions Co., Brooklyn, N. Y. The device is the result of five years' study and experimentation, and while installed on a Ford engine can be utilized with equally satisfactory results with any variable load, variable speed multi-cylinder engine, truck or pleasure car. The present apparatus has been operated over 4,000 miles on kerosene, and the car is utilized by Mr. Good between the factory and Oyster Bay daily, and is obtaining equally as good mileage as possible with gasoline.

With the Good vaporizer it is possible to obtain a dry, hot mixture, one that can be properly distributed to the cylinders, and an interesting feature is that the temperature is maintained practically constant irrespective of engine loads, speeds, etc.; in fact,

exhaust header, is practically of the same length, and is mounted directly in front of the exhaust ports. This construction places the tube where the exhaust gases are hottest, and the tube obtains a high velocity at its throat with a correspondingly considerable pressure depression, and a minimum loss of pressure between the ends. The velocity obtains good heat transmission, the throat pressure depression aids in rapid vaporization by reducing the total mixture pressure and the partial vapor pressure. The enlarging cone converts the velocity back to pressure and without any appreciable loss. The fuel supply is by a Stromberg carburetor, which is adjusted for gasoline, the carburetor feeding kerosene in what may be termed a wet mixture

The Burner of the Good Vaporizer

The heat necessary for starting is obtained by fuel spray or mist electrically ignited, and a flame of intense heat is secured by a jet of air under pressure

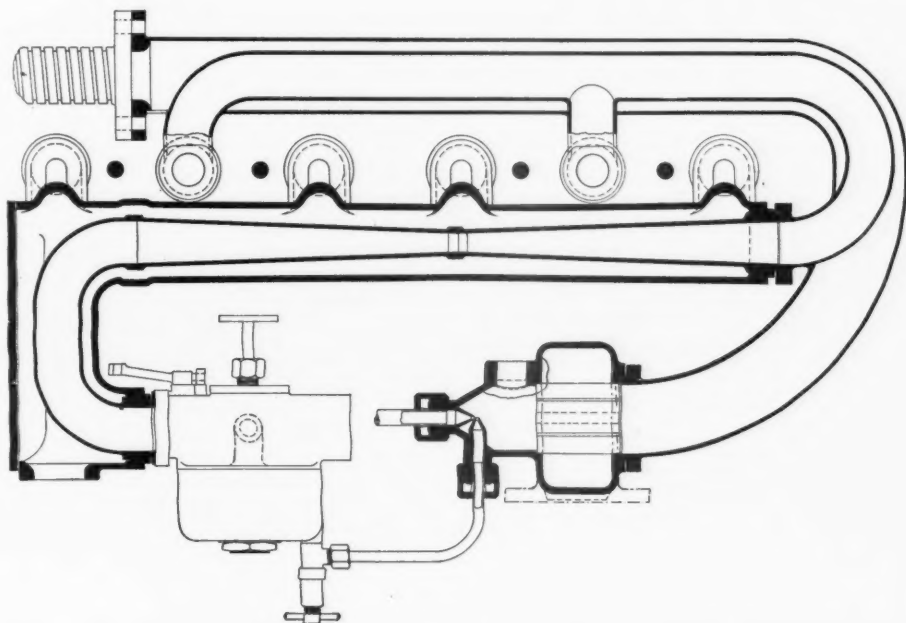


it is stated that laboratory tests show but a variation of 20 degrees Fahrenheit. The Good vaporizer takes the form of a narrow angle Venturi tube which is constructed of very thin steel tubing. It is located in the

state. This mixture in passing through the heated Venturi tube is converted into a warm, dry, homogeneous mixture, one that is equally distributed to the cylinders, and insofar as starting and operation are concerned, cannot be distinguished from that obtained with the conventional fuel.

The Starting Burner

What is, perhaps, the most interesting feature of the Good apparatus, is the starting burner which is shown disassembled in an accompanying illustration, also attached to header on the engine. The burner has a vertical fuel nozzle and is supplied from the float chamber of the carburetor. The fuel in emerging from the nozzle encounters a horizontal jet of air supplied by a blower, and is converted into a fine spray or mist. This passes into a chamber where it is enveloped by air to support combustion. This spray or mist is ignited automatically by the electrodes of two spark plugs in the flame housing, and the electrodes are inverted to avoid the possibility of fuel collecting. In the installation referred to, the battery current is intensified by a small induction coil, but use can be made of a low-tension magneto or generator operated by hand, the storage battery of the starting system or by a small generator in connection with the blower which supplies the air for the burner. Owing to the difficulty experienced on ob-



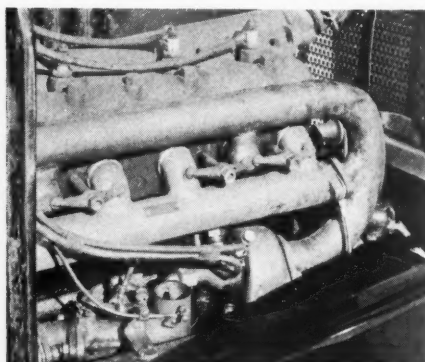
The Good Venturi Tube Vaporizer

The tube has very thin walls, is located in the exhaust header, and the effective heat transmission obtains a warm, dry, homogeneous mixture

Interesting and helpful information; reputable advertisements—that's the CCJ

taining suitable equipment, the battery and coil has been used by Mr. Good, who intends, however, to adopt a compact mechanical generator. The stream of air supplied to the burner is provided by a small blower through a flexible metal tube, and the blower is operated by a small electric motor.

The flame obtained with the Good burner may be compared to that secured with the Bunsen burner, so quickly does it develop the heat necessary for starting. The combustion is pronounced only beyond the radial guide vanes at the exit from the burner or at the entrance to the heating tube.



Good Vaporizer on Ford Engine

The supply for the burner is taken from the float chamber of the carburetor, which supplies kerosene for running. The elbow or joint noticeable between the carburetor and header was used to facilitate installation and is not a part of the apparatus.

The combustion continues only so long as the switch controlling the blower, flame, etc., is closed, the burning ceasing automatically when the circuit is opened by the switch. With the apparatus used on the Ford car the fan motor is started and stopped by a button type of switch, and the time required to start the engine from cold was approximately 10 seconds after the blower and burner were started. The car had been standing for several hours in the street and the temperature that day was about 45 degrees.

The flame tube became so hot that spittle boiled on it in less than 10 seconds, and when the engine starter rotated the crankshaft of the engine it started readily and without the surging effect so noticeable when starting with gasoline on a cold morning. The period required for the engine to warm was no longer than when gasoline is used, and the engine idled and accelerated without the exhaust emitting black or pungent smoke as is generally the case where kerosene is used. The odor of the exhaust was not disagreeable, and while not exactly "sweet," as with a perfect proportion of burned gasoline and air, it was far more agreeable to the nostrils than the average slightly rich gasoline exhaust. There was an absence of smoke, both when the engine was idling and running at high speeds and loads, although the oil supply was normal, doubtless due to a complete burning of the mixture.

Insofar as operation of the machine is concerned, the writer accompanied Mr. Good in a ride that took the car over

varying kinds of roads and grades. The engine pulled evenly and strongly at low speeds and accelerated perfectly. Although the muffler was located near the frame under a forward fender, and where the exhaust could be noted, there was no noticeable smoke or black exhaust at any engine speed. At the end of the run when the engine was warm it apparently operated as efficiently as during the early stages of the trip.

Mr. Good stated that the cylinder head was removed after 3,000 miles and examined for carbon deposits and that none were present. A similar apparatus was used in a former Ford and throughout the winter, and employing kerosene. The car was not stored in a heated garage, and started readily during the coldest of weather. Mr. Good has dispensed with gasoline in his power boat as well by means of his vaporizer, employing kerosene as a fuel with a four-cylinder Lamb marine engine. The results have been entirely satisfactory. Relative to the kerosene, no particular grade is employed, it being purchased as convenient. Although the tank was well filled with kerosene and an ordinary carburetor employed, and the latter primed by the usual method, no odor was

noticeable, although it was anticipated. As may be noted by the illustration showing the apparatus on the Ford engine, an elbow or joint is utilized between the carburetor and header. This was necessary owing to the limited space between the carburetor and the burner, but is not necessary with the Holley carburetor which was employed on the former Ford car. A valve for shutting off the supply of air to the Stromberg carburetor is only used in cold weather, it being standard equipment with the carburetor.

Although the Good vaporizer has not been utilized with the commercial car engine it is but logical to assume that its performance would be equally as satisfactory if not more efficient as the truck engine operates under a more constant load and speed. The easy starting feature of the burner is an advantage that would be appreciated with gasoline as a fuel when starting a cold engine and after it has been exposed for a long period to very low temperatures. Eventually we must come to kerosene or a fuel of approximately the same specific gravity as kerosene for the supply of gasoline is, unfortunately, exhaustible.

SPECIAL BODY FOR LIGHT BUT BULKY LOAD

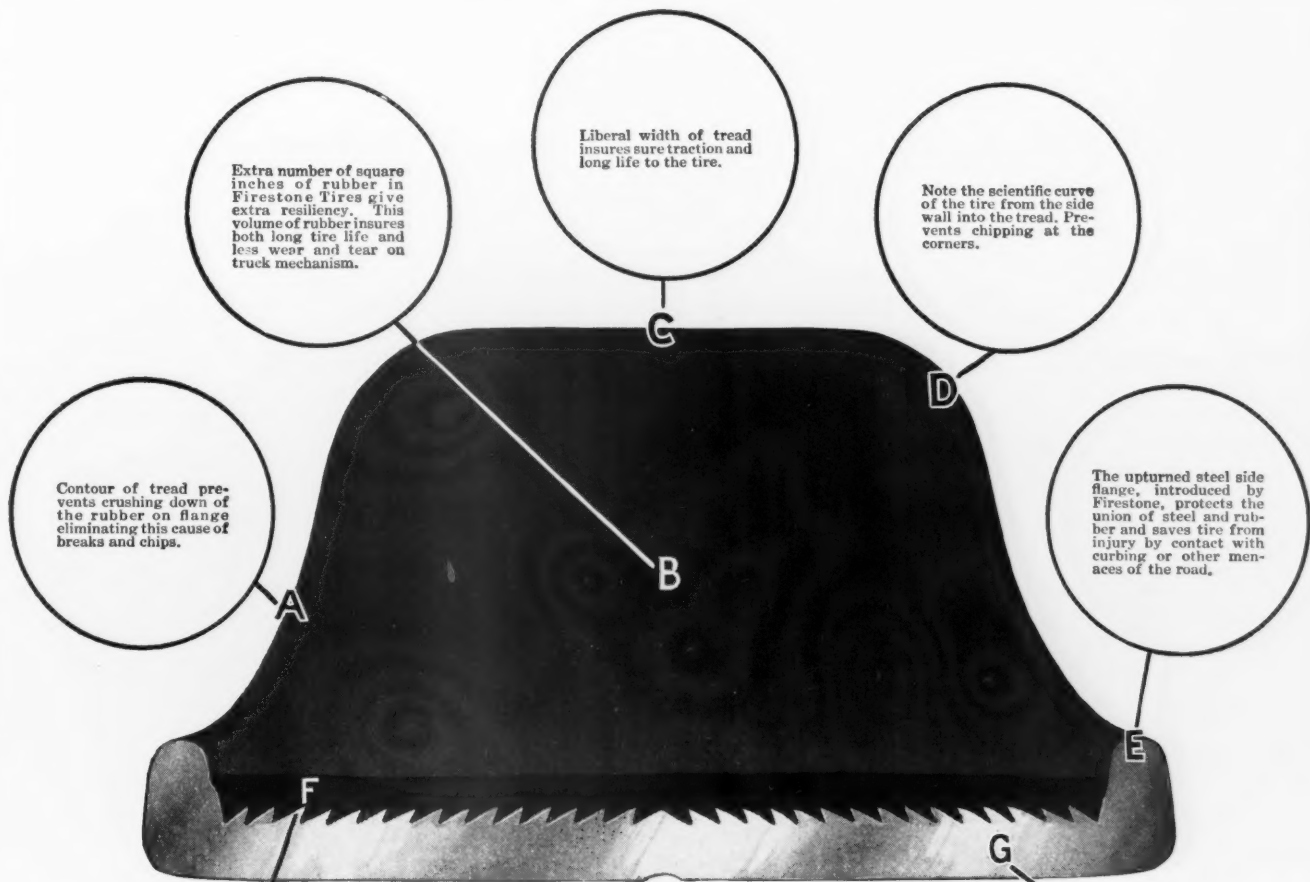
The Verhey-Noorthoek Lumber Co., at Grand Rapids, Mich., employs several heavy duty trucks in hauling loads of solid lumber and, until a few months ago, it was necessary for the company to use these large vehicles in connection with light hauling also. At that time the necessity for a light truck, to handle large but light loads, became imperative and a $\frac{3}{4}$ -ton Menominee with a special body, was purchased. A wheel base of 160 in. was incorporated with a length of 12 ft. to the body. This size permits even larger loads of the light materials than were formerly carried on the heavy-duty trucks, and the expense of upkeep and maintenance is much less. The load shown in the accompanying illustration consists of 15 window and door frames, which, although they weigh little,

occupy a great deal of space. The special body adequately cares for the demand in space and the light truck equipment meets all the demands for power. The truck has created so much satisfaction that others will be added later and at least one of the heavy duty trucks eliminated.

WESTINGHOUSE ELECTRIC & MFG. Co. has extended its present bonus system to include salaried and office employees on hourly rates by which they will receive a bonus of 8 per cent. of their salary each month, provided their total excusable time absent and late during the month does not exceed six hours incurred in not over three occasions. An additional 4 per cent. will be given each month to the employee who has not lost any time through absence or tardiness.



Three-Quarter Ton Menominee Used by the Verhey-Noorthoek Lumber Company, at Grand Rapids, Mich.



Cross Section Pressed-on Truck Tire

An Inside View

THIS section view of a pressed-on type of Firestone Truck Tire reveals the details of its construction. An inside view to enable you to form a more intimate and intelligent opinion of the merits of this type.

When pressed on to the wheel by means of an enormous hydraulic press, tire and wheel practically become a unit. Nothing can remove this tire except the same type of hydraulic press. An advantage of the pressed-on tire, aside from its grip on the wheel is its lighter weight.

Study the specifications, briefly outlined.

There is a Firestone Truck Tire for all roads, loads and conditions of service.

Will you make use of the services of one of our experts in the selection of your truck tire equipment?

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Firestone TRUCK TIRES

Northwest Dyers Replacing Horses With Motor Cars

By WARREN EUGENE CRANE

THE one-horse delivery wagon in the cleaning and dyeing business in the Northwest is being displaced rapidly by the commercial car. There are a few teams left in the service of these institutions, but it is the intention to put light delivery cars in their places as soon as the horses can be disposed of at a reasonable price.

The Queen Anne Dye Works, Seattle, Wash., one of the largest and most modern cleaning plants on the Pacific coast, has eleven machines in service—six Fords and five Studebakers. Four double teams are also operated in districts that are partly paved.

"Our delivery cars cost us \$40 per month on an average," said C. Murray, the general manager. "These figures include gasoline, tires, lubricating oil, fire insurance, liability insurance, accident insurance, repairs, depreciation and incidentals. Figuring in feed, insurance, repairs, harness, shoeing and stable rent, our four two-horse teams average \$50 a month each. We find that our motor cars cover twice as much territory as the double teams at 80 per cent. of the operating cost. By next spring we expect to have all of our horses sold and they will be replaced by two of the new one-ton Ford trucks. During the comparatively short time that we have been in business, we have had a wonderful growth from one little room to a big, three-story plant, and I attribute it to the fact that we have used the motor car more extensively than our competitors. In this way we have increased the volume of our business at a lower overhead cost."

The Harrison Dye Works, of Seattle, conducts a wholesale dyeing and cleaning business. It operates three Ford delivery cars and no horses. According to Ole Sovde, the manager, the operating cost is \$30 per month on each machine. This is less than that of other dyeing firms because the cars do not go from door to door, and no insurance of any kind is carried on them.

The Union Dye Works operates three Ford delivery cars and one team of horses. During the year of 1915, F. Islander, the manager, kept an accurate account of the operation cost of each of his cars, as well as his horses, and his results are as follows: The first car, which covered the hilly eastern part of the city, cost him \$509.23 for the year, including insurance, tires, gasoline, lubricating oil and incidentals; the second, which covered the more level sections, such as the University District, cost \$496.47, and the third, which covered the whole city, collecting private work, only cost \$505.08. His double team, which called upon the downtown wholesale trade, necessitated an expenditure of \$598.35. The

monthly running expenses on the team were as follows during the month of October:

Shoeing	\$4.00
Stable rent and feed.....	45.00
Insurance	1.45
Wagon repairs	2.00
Harness .....	.50
	<hr/>
	\$52.95

From the 1915 figures this company found that the average operating cost for a team of horses is \$49.86 per month, and for a Ford delivery car \$41.68. The machines furnish better service at less cost, and consequently the management is very well satisfied with the results.

The Dixie Dye Works operates three de-

automobile cost is \$234.83 a year, or \$33.50 a month. The company is selling its horses as fast as it can, however, and replacing them with automobiles because it has found that the commercial car is a real business builder, giving the driver more time to solicit business than when he rode behind a slow-moving horse between each call.

The Capitol Dye Works operates a Ford light delivery car, which runs between 30 and 40 miles a day in the outlying districts of Seattle. The gasoline costs between \$14 and \$15 a month, while the total expense, including tires, repairs, lubricating oil, insurance, gasoline and depreciation, is between \$30 and \$32 a month. This company also reports that it finds the automobile delivery more satisfactory than horses and wagons.



How an Enterprising Cleaner and Dyer, of Portland, Oregon, Advertises His Business While Delivering His Work

livery cars, which have been found very satisfactory. In October, the expense for its Krit delivery car was as follows: Storage and repairing, \$8.33; gasoline, \$7.81; lubricating oil, \$1.60; tires, \$10; insurance, \$4; total, \$31.74. Its Ford operating expenses were: Tires, \$10; storage and repairing, \$8.33; insurance, \$4; gasoline, \$11.87; lubricating oil, \$1.60; total, \$35.80. The costs for its Flanders were: Tires, \$10; gasoline, \$12.09; lubricating oil, \$1.60; storage and repairing, \$8.33; insurance \$4; total, \$36.02. This company has disposed of all of its horses and wagons and is using automobiles exclusively.

The Pantorium Dye Works uses seven Ford delivery cars and six horses and wagons. According to J. W. Walker, president, the one-horse wagon cost is \$209.25 a year, or \$29.96 a month, while the

"We find the commercial car the only satisfactory answer to the delivery problem," said H. B. Spencer, of the City Dye Works. "They give better service to the customer than horses; cover twice as much ground and cost us less. We are operating one E. M. F., one Buick and seven Ford delivery cars, with a yearly operating cost on each machine, which has averaged as follows: Repairs, \$50; insurance, \$50; tires, \$60; gasoline, \$180; lubricating oil, \$12; total, \$352. We use one horse and wagon, which costs us \$22.50 a month for feed and stable expense, \$6 a month for shoeing, and our usual repainting and repairing costs \$4.25, making a total expense of \$32.75 a month, while our average automobile expense is \$29.33 a month. We have found that one of the main requisites in the making of a success in the dyeing business is

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

service, and that is one of the things that is promoted by our automobile delivery. We expect to dispose of our last horse and wagon in the near future and replace them with a light delivery car."

The City Cleaning and Dyeing Works, of Portland, Ore., of which H. Enke is manager, has been operating a 1500-lb. White delivery truck during the past three years. The average monthly expense for gasoline, oil, grease, tires, repairs, depreciation, insurance, taxes and interest has been \$50 a month. The machine has a picture of the plant painted on the side of it, as shown in the accompanying illustration. The car has proved an excellent advertising medium as

well as a valuable means of insuring prompt deliveries to its customers.

L. L. Bechel, manager of Louie's French Dye Works, of Seattle, operates a Metz car in all parts of the city and suburbs. He finds it more satisfactory than his horse and wagon as he can cover a greater amount of territory at a cost that is materially less. His gasoline and lubricating oil cost is \$9 per month, while his insurance is \$12.75 per year. Mr. Bechel states he has had no repair or tire expense during the five months that he has operated this car.

After a careful investigation of the delivery service of various dye works and in-

terviews with several of their proprietors, the following conclusions have been made:

1. The operation cost of a commercial delivery car is about the same as for a single horse and wagon, and 80 per cent. of that of a double team.
2. The car covers twice as much territory as a double team.
3. Motor deliveries furnish more prompt service than horses.
4. They insure the dyer steadier and better satisfied customers.

The delivery car has proved of great aid in the development of the dyeing business of the Northwest, and it can be predicted that the horse will eventually be completely displaced by the gasoline vehicle, if the changes in the coming decade are as revolutionary as in the past ten years.

Light Commercial Car in Place of One-Horse Wagon

What a Few Buffalo Users Say on the Subject

By R. E. DOWNER

USERS of light trucks in Buffalo are so well pleased with results that most of the men who formerly used one-horse delivery rigs have quite forgotten whatever advantage those outfits ever offered. The light truck has fitted into its place so naturally and assumed increased burdens so readily that as a rule the houses which formerly got along all right with a single horse and wagon are now doing a volume of business which no horse could keep up with.

Commercial Car Quick and Satisfactory

Alvin W. Day & Co., manufacturers of and dealers in artistic mantles, grates, tile, etc., used for years an attractive one-horse delivery rig. The street cars and the trucking companies helped out in covering business in distant parts of the city, and orders for equipment to be placed in homes in the suburbs were supplied by express or freight, the workmen going by passenger train. But an Atterbury 1-ton truck has changed all that. The truck now makes all deliveries in the city and suburbs, the men who are to install the equipment traveling swiftly and conveniently with the shipment.

Saves Cost of Extra Haulage

L. H. Neubeck, florist, has a nifty delivery body on a Ford frame. He delivers cut flowers and plants, sends his men on gardening jobs, and does personal errands in between, yet still gives rapid service. Mr. Neubeck says that he does twice or three times the business with the automobile that he did with a horse delivery, and, moreover, saves in cash \$135 to \$140 he used to pay annually to a delivery company for handling business which he could not cover with his own horse.

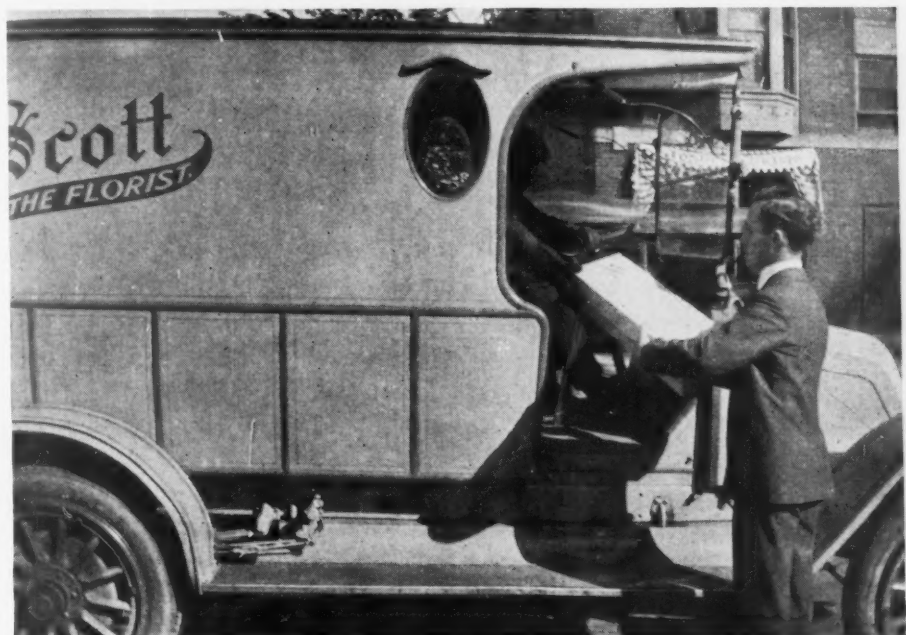
The Allen Hardware Co., dealing principally in builders' hardware, has a similar

story to tell. This concern has used motor delivery for eight years. At present it is using a Lippard-Stewart 1500-lb. truck; it has all but abolished freight delivery charges by doing the work with its own truck, and it is enabled to do all its own delivery in a business practically covering the city.

Diebolt & Berst, furniture dealers, also make a specialty of satisfying customers by giving quick delivery. Moreover, they give service as far away as Niagara Falls, see six or eight customers in a trip that would have caused their arrest on a charge of cruelty to animals if they had used a horse,

and get back in time for the late afternoon business. This firm uses a Stewart 1500-lb. truck.

The William Scott Co., florists, used a 1500-lb. Lippard-Stewart. "The florist business is of such a nature as to require a good appearance in delivery as well as in wares," said Robert A. Scott, president of the company. "Much of the business is done on rush last-minute orders and quick delivery is necessary. A horse could never meet the requirements of a modern florist. Besides, it is an invidious distinction not to have an auto delivery. People no longer say, 'So and So have an auto.' They say, 'So and So are still using a horse.'"



Rush Orders Are the General Thing in the Florist Business
Lippard-Stewart used by the William Scott Company, of Buffalo, N. Y.

Merit wins—that's why the CCJ is the leader

Stewart

5th Annual ANNOUNCEMENT

THREE MODELS

Model 6,	1500 lbs.	Capacity	\$ 795	Chassis
Model 3,	1 Ton	Capacity	\$1390	Chassis
Model 4,	1½ Ton	Capacity	\$1485	Chassis

TRIED AND PROVEN

Real Quality Trucks at Quantity Prices is the Stewart Policy. The first Stewart Quality Trucks made by us several years ago are today giving excellent satisfaction to their owners. Frequent repeat orders have been the result. There are many owners, each having fleets of 2 to 54 Stewarts. Hundreds of prominent and nationally known concerns are using Stewarts.

Do not experiment—buy a Stewart. It has been proven and tried in every line of business.

Model 6
Chassis \$795
Capacity 1500 lbs.



General Specifications

Four-cylinder engine; 25 horse power; Zenith carburetor; three-speed transmission; dry-plate clutch; magneto; internal-gear drive truck axle; demountable rims; 32 x 4 tires; glass front; mechanical horn; tool kit; jack; tire pump; extra rim. Wheelbase 110". Body 6½ ft. loading space. Strongly made and beautifully finished.



Stewart Motor Corporation, Buffalo, N. Y.

Stewart

5th Annual ANNOUNCEMENT

\$3,000,000

We have purchased more than \$3,000,000 worth of material for Stewart Quality Trucks for 1917; thus insuring prompt deliveries.

574% INCREASE

574% more Stewarts were sold in 1916 than during the previous year. Merchants everywhere are rapidly adopting motor trucks. The truck boom has arrived. Wise dealers are now after the best truck agencies.

EASY PAYMENT PLAN

Stewarts can now be purchased by merchants on our Easy Payment Plan; and at no expense to the dealer.

Model 4
Chassis
\$1485
Capacity
1½ Tons



General Specifications

Four-cylinder motor; horse power 30; Zenith carburetor; magneto; three-speed transmission; multiple-disc dry-plate clutch; internal-gear drive axle; tires solid, 34 x 3½ front, 34 x 5 rear. Wheelbase 140". Many styles of bodies.



Stewart Motor Corporation, Buffalo, N. Y.

Proposed New Jersey Truck Bill

Unjust and Unnecessary Requirements Would Impose Hardships on Truck Users

By C. P. SHATTUCK

USERS of trucks in New Jersey and non-residents, whose vehicles visit that State, will be subject to a tax that will seriously hamper the profitable use of trucks there if the discriminatory bill, drawn up by the special committee appointed by the commissioner of motor vehicles in New Jersey, becomes law. Not only is it proposed to tax the truck an exorbitant rate under the guise of a license fee, but the committee proposes regulations that are not founded upon any practical or logical basis. The fight made by the representatives of manufacturers and engineers resulted in some of the original sections being modified. A ridiculous one would have compelled every truck to carry a spare wheel. Another section defeated was that compelling the driver to carry way bills to show the gross and net load carried.

The proposed bill limits the width of trucks to 96 in., outside measurements, but in extreme cases wider vehicles may be operated by obtaining a permit, but the load is a factor. Metal tires of any type, no matter how wide or if the weight be properly distributed, cannot be used and semi-trailers and trailers must be equipped with rubber shod wheels. It was proved by representatives of tire manufacturers that not only would it require special equipment to construct tires for trailer wheels of 54 or 56 in. in diameter, but that it would take considerable time and that the cost to the consumer would be prohibitive. A number of concerns, having a large investment in semi-trailers, stated that the enactment of the bill would either compel them to discard their tractors and return to horse-drawn equipment or else build trailers to conform to the proposed law. On this point the committee proved obdurate, stating that they were satisfied that motor trucks are responsible for the destruction of the roads and that rubber tires must be used and according to the schedule prepared. The schedule, which is appended herewith, is complicated as are the sections, that will compel the designer of a truck to build his vehicle to carry two-thirds of the gross weight of machine and load so as to conform to the wheel, tire and speed schedule and the balance on the front axle.

To prevent damage to the highways in the event of injury to the rubber tire, and to prevent any metal of the rim, etc., coming in contact with the road, a fine of \$500 is proposed if the driver does not immediately stop his car which cannot be moved until proper repairs are made.

It is proposed to compel every commercial vehicle to carry a plate on the left hand side of the chassis, bearing the name of the maker, number, model, motor number, maximum weight of truck with body and load in pounds, net load and maximum

speed in miles per hour, and an affidavit must be made that the maximum weight shall not be exceeded.

Trailers are to be licensed on their carrying capacity, and when that is equivalent to the gross weight of the load in the schedule for license fees, the charge will be the same. Tractors are defined as motor power vehicles without bodies and are to be licensed on their gross operating weight, and the size of the wheel and tire must conform to the schedule.

Section 21 makes the owner of a truck responsible for any damage to a bridge where gross weight carried by the truck exceeds the carrying capacity of the bridge. When asked if the motor vehicle commission proposed to post a bridge as to its capacity, it was stated it would not. It was also remarked that if a truck within the limit of weight, load, etc., went through a bridge because of its deterioration, that the owner of the truck would be held responsible. This section also states that all commercial cars equipped with pneumatic tires shall be licensed in accordance with the motor vehicle act governing pleasure vehicles.

The bill also limits the height of a truck to 12 ft. 2 in., prohibits the use of a center searchlight, and compels the attaching of a red flag to loads extending beyond the ends of the truck. Inspectors are to be appointed to see that the provisions of the bill are adhered to.

The final hearing on the bill was well attended and the Motor Truck Club of America was represented by its attorney, Charles G. Bond, of Coulter & Bond, counsel for the organization. Unavailing efforts were made to show that horse drawn equipment hauling heavy loads on narrow steel tires and even pneumatic-tired pleasure vehicles were responsible for wear of the highways.

The proposed bill is discriminatory and class legislation for it is not imposed equally upon all users of the highways. If enacted into a law it will affect business concerns of New York City that cross to the Jersey side for freight and merchandise, and whose trucks do not use the highways to anywhere near the same extent as the Jersey trucks. In other words, it may cost the owner of a truck in an adjacent State over \$100 to make a trip into New Jersey even if he travels but a few miles on the Jersey highways. The New York dealers were well represented at the hearings and a movement is on foot to defeat the obnoxious sections of the bill which is scheduled to be reported to the coming winter session of the New Jersey legislature. If enacted the bill will become a law on January 1, 1918.

Maximum Wheel Loads in Pounds and
Maximum Speed in Miles Per Hour for
Motor and Motor-Driven Vehicles
Equipped With Tires of a
Given Diameter and Size

Size of Tires Single	Diameter of wheel and carrying capacity inches					Speed Miles per hour for rear wheels
	32	34	36	38	40	42
2	565	595	625	660	690	720
2½	840	890	940	990	1040	1090
3	1125	1190	1250	1315	1375	1440
3½	1414	1490	1565	1640	1715	1790
4	1690	1780	1875	1970	2065	2155
5	2250	2375	2500	2625	2750	2875
6	2815	2970	3125	3285	3440	3595
7	3375	3565	3750	3940	4125	4315
Double						
2	1125	1188	1250	1312	1375	1438
2½	1675	1775	1875	1975	2075	2175
3	2250	2375	2500	2625	2750	2875
3½	2825	2975	3125	3275	3425	3575
4	3375	3560	3750	3940	4125	4310
5	4500	4755	5000	5250	5500	5750
6	5625	5940	6250	6565	6875	7190
7	6750	7125	7500	7975	8250	8625

Schedule Showing Annual Fee and Fee in
September, Based on Gross Weight

Gross weight of truck and carrying capacity, lbs.	Annual Fee	Fee in Sep- tember
4,000 or less	\$15.00	\$7.50
4,000 to	17.50	8.75
5,000	20.00	10.00
6,000	22.50	11.25
7,000	25.00	12.50
8,000	27.50	13.75
9,000	30.00	15.00
10,000	32.50	16.25
11,000	35.00	17.50
12,000	40.00	20.00
13,000	45.00	22.50
14,000	50.00	25.00
15,000	55.00	27.50
16,000	60.00	30.00
17,000	65.00	32.50
18,000	70.00	35.00
19,000	75.00	37.50
20,000	81.25	40.63
21,000	87.50	43.75
22,000	93.75	46.88
23,000	100.00	50.00
24,000	106.25	53.13
25,000	112.50	56.25
26,000	118.75	59.38
27,000	125.00	62.50

RAISING LONDON TAXICAB FARES

There is trouble in the taxicab trade of London. Until now the legal fare has been about 16 cents a mile, or if the speed of the cab falls below 8 miles an hour, at the rate of 16 cents for 10 minutes. The war having raised prices on everything, the cab proprietors are asking the authorities that the legal fare be increased to 20 cents. The drivers, however, are strongly opposed, fearing they will get smaller tips. Now they are usually paid 1/ for an 8d fare, and are thus able to keep one-third of the receipts for themselves. If the legal fare was raised to 10d, the public would not be likely to pay the driver any more, and he would be the loser. It must be admitted that 33 per cent. of the total collected is an absurdly high proportion for tips. On the other hand, the extra cost of living is also affecting the men. The fairest way out of the difficulty seems to be a compromise of charging 18 cents for a mile, or for 10 minutes on the time rate.

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Equally important with the quality of the units is the careful engineering and the practical skill with which the various units

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Detroit, Mich.



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The Growth of the Motor Truck Industry

An Address Before a Number of Dealers, by the General Manager of the United Motors Company, of Grand Rapids

By GEORGE P. SWEET

THE rapid growth of the motor truck industry has been no less sensational than that of the automobile. It scarcely seems necessary for me to enumerate the various lines of industry to which the commercial vehicle has been applied.

To give you as many facts about motor trucks as possible in the brief time allowed me, I will give you a few of the statistics from which you will be able to gather the history, growth and present size of the motor truck industry.

In the matter of production, available figures of any consequence commence with the year 1909, in which year 5,500 commercial vehicles were built. These figures show a steady increase without a single setback. In 1910 there were 9,000 built; in 1911, 17,000; in 1912, 25,000; in 1913, 28,000; in 1914, 35,000; in 1915, 74,000, and in 1916, 98,000.

Taking 1916 for example, with a production of 98,000 motor trucks, it is interesting to note what this number is made up of. We find that 50 were steam driven, 635 were electric driven, and the balance, 97,315, were propelled by the gasoline engine. Of the gasoline-driven trucks, 50 per cent. were of a capacity of 1500 lbs. or less, 15 per cent. were 1½-ton, 35 per cent. from 2-ton up. Thus we will see that trucks are divided into two classes—those up to 2 tons in capacity, which we describe as delivery wagons, and those of 2 tons capacity and up, which we describe as heavy duty trucks. With this thought in mind, it is easy to realize why only 10 per cent. of the commercial vehicle producers build 50 per cent. of the vehicles because the small light trucks are necessarily the ones of quantity production.

There are, at present, 211 recognized manufacturers of motor trucks in this country, and their plants and property represent an immense investment.

The estimated production for 1917 will be 165,000 trucks. In 1916 the total truck sales were valued at \$187,000,000, \$67,000,000 of which was for the size under 2-ton. In the percentage column I find that the 2-ton size and smaller represent 60 per cent. of the production from point of number and 40 per cent. represents above the 2-ton size. The estimated production for 1917 shows an increase of 100 per cent. of the smaller sizes under 2 tons and an increase of 50 per cent. of those above 2-ton.

A careful compilation of the specifications of all the models announced for 1917 by the 211 manufacturers of motor trucks gives us a very clear idea of the trend of design. It indicates several interesting facts. I will only discuss the principal units which go to make up the modern motor trucks.

Starting at the radiator, we find that while the cellular type has steadily increased in popularity since 1915, the thin tube type, which was used on 42 per cent. of the trucks in 1915 and 51 per cent. in 1916, has dropped back to 41 per cent. for 1917. We find that the 4-cylinder engine is used almost exclusively on the commercial vehicles. This ideal truck, made up from the averages of all the 1917 trucks has a three-speed gear shift. It has the dry disc clutch. It has the gas tank under the seat and gravity feed. It has the tubular shaft and worm-drive axle. It has the Hotchkiss drive construction for taking the torque and propulsion through the springs. It has the pressed semi-flexible spring and gear ratio of 7.8 to 1, and the average price is \$2550.

One of the most discussed points with reference to the motor truck of today is the final type of rear drive, and again referring to statistics, in 1913, 1 per cent. of the motor trucks manufactured used the worm drive. This increased to 11½ per cent. in 1914, in 1915 to 21½ per cent., in 1916 to 44¾ per cent., and in 1917 to 61½ per cent., which is three times greater than any other type of drive. Chain drive is next, with 20 per cent. It has been steadily decreased since 1913, when it was 79 per cent., and in 1914 it went down to 68½ per cent., in 1915 to 58¾ per cent., in 1916 to 33 1-3 per cent. and down to 20 per cent. in 1917. The internal gear drive, about which there has been considerable talk, and which was 1 per cent. in 1913, the same as the worm drive, crept up to 2 per cent. in 1914, 7¼ per cent. in 1915, 12¼ per cent. in 1916, and dropped back to 9¾ per cent. in 1917; the other scattering percentage for 1917 is principally bevel gear. This applies, of course, exclusively to the small delivery trucks.

The prevailing type of ignition is by magneto only. This represents 75 per cent. of the commercial vehicles for 1917, there being 23 per cent. using dual ignition, and 2 per cent. using double ignition. The plain battery ignition has not yet appeared on motor vehicles.

It is interesting to note that there will be built in 1917 no air-cooled motor trucks.

It is also interesting to note that while there has been a steady increase in the use of the left-hand drive since 1913, this shows a falling off and a tendency to go to the right-hand drive. The left-hand steer, however, is still largely in favor, there being 68 per cent. left-hand drives to 32 per cent. right-hand drives.

Profit from motor trucks can be said to vary almost directly in proportion to the time saved in loading and unloading. An organization which changes from the horse-drawn method to the truck method

must be remodeled to adapt itself to the most efficient practice necessary for the profitable operation of the trucks. Owners who realize this fact and arrange their shipments and loads accordingly reap bountiful earnings from their trucks in almost every instance.

I have in mind a contractor in Southern Indiana who purchased a 4-ton truck early last summer. He had never owned a motor truck, and was 16 miles from the closest railroad station or town. He put the truck in commission hauling crushed stone used in the construction of good roads. He recently wrote to us that he has averaged 50 yds. daily. His average mileage has been 78 miles per day. His cost of operation has been \$3.10 per day for gasoline and oil. He pays his driver \$2 per day. His truck has hauled sufficient crushed stone to equal that which would have been hauled by 10 teams, at an average cost of \$3.50 per day. He has had a net earning from his truck of approximately \$30 a day. His total cost of repairs was \$19. In short, his net earnings from this truck during the summer have reimbursed him 100 per cent. for the investment which he made in it, and showed him a handsome profit besides, and he still owns the truck, which is in good serviceable condition and capable of repeating the performance for a long time to come.

I was talking with a farmer not long ago in Southern Michigan who purchased a 3½-ton truck, who told me, that although 14 miles from St. Joseph, he was able to keep on picking his fruit and shipping it to the Chicago market after it had become so ripe that it could not have been shipped had he had to haul it by wagon over those 14 miles of rough road.

Profits in the motor truck business are about the same as other manufacturing lines doing an equal volume of business. Shipments are gradually increasing in volume and nearly all concerns will sell in advance of production during the coming year. The demands of the public for prompt service create a condition which, almost of necessity, demands production and distribution of an increasingly large number of motor trucks in this country for years to come. The business is a fascinating one, and once in it, men rarely leave it. The daily duty of the motor truck man is the accomplishment of things, which in the ordinary run of manufacture, is considered impossible. The satisfaction of selling an article which will increase the volume of business done by your buyer and prove to have the largest earning capacity in proportion to its investment of any part of his equipment, is in itself sufficient compensation for the long hours necessary in our line of work.

ROSS GEARS

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Predominate
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Ten years of successful performance have so thoroughly demonstrated the superiority of Ross Steering Gears that they are accepted as standard equipment, and are now in use on one hundred and twenty-one different makes of motor trucks.

Their perfection of design makes them wonderfully easy to operate, with the highest degree of safety and reliability, while the quality of the materials used and the excellence of workmanship insure long life and service.

If you are interested in steering gears that will measure up to these standards, that will do their work satisfactorily and successfully, write for our catalog and any specific information you may desire.

THE ROSS GEAR & TOOL CO.
760 Heath Street Lafayette, Indiana

The North River Vehicular Traffic Situation

By GEORGE W. GRUPP

NEW YORK CITY is isolated from New Jersey geographically. And for this reason there is a crying demand among the New York City and adjoining New Jersey cities vehicle owners, and particularly among the motor truck owners, for a swifter vehicle communication between the cities than is now being conducted by the ferry boats. They believe that ferry transportation has served its purpose and therefore must give way to means more swift. The truck owners realize that they are not earning the dividends which they might were it not that their trucks are required to wait anywhere from 10 to 30 min. for a ferry, and then take a chance of being left over because too many trucks were ahead.

Ferries Too Slow

This slow method of transportation does not appeal to the truck owners. They are perfectly conscious that their trucks are

with some concern. Their delivery capacity is being cut down by the lack of initiative on the part of those who could best bring about a solution for this growing problem. And besides it is nothing new. This question of correcting this slow vehicular traffic between Manhattan and Jersey has been under discussion ever since 1868. But the day of linking these two states cannot be put off very much longer. New York City is getting smaller each day because of traffic and freight congestion and because the Jersey cities are becoming too closely related to the Metropolis.

Ninety Per Cent of Vehicular Traffic Below Fiftieth Street

Time and again it has been suggested by engineers that either traffic bridges or tunnels should be built. The river traffic below West Fiftieth St. is enormous, and vehicular tunnels are vitally necessary to care for the traffic between Jersey City, Ho-

Further, with tunnels underneath the Hudson, the river frontage, from Battery Place to W. 30th St., a distance of 3.91 miles, of which 7.8 per cent. is occupied by ferry landings, could then be converted into freight houses. Thus the growing congestion among the local freight houses and the long delays in waiting for deliveries could be avoided. More trucks could get to the freight houses and be more quickly and easily served. And finally the moneys now spent for ferry rentals could be used for greater profit earning uses.

Ferries Not Profitable

The ferry boats are not making any real money. The railroads, themselves, claim that they are losing money. There has been a decline in passengers carried since the completion of the Hudson & Manhattan and P. R. R. tubes. This is only one piece of evidence that they are not making money. As a result ferry boats are not being run whenever it is not necessary.

Tunnel the Solution

From the foregoing remarks one can see so much loss of time is a hindrance to the truck idea and the efficiency of it. If tunnels were used instead the actual running time between shores would only amount to from 3 to 5 min., and there would be no delays, such as caused by waiting for the ferry, missing it, ferrymen's strikes, being left over, waiting for the ferry to dock and unload, etc.

Traffic tunnels, however, are not going to be built until the vehicle owners co-operate and bring sufficient pressure to bear on the legislators, etc. The state legislatures, the municipalities and railroads will not co-operate with them until they demonstrate that they mean business and that they know what they want, and that they really want it.

Therefore, if the motor truck, vehicle owners and others will but put their shoulders to the wheel and push, then the states of New Jersey and New York will be linked; swifter means of communication will be possible; there will be less street congestion near ferry landings; ferry boat landings can be converted into freight houses to relieve congestion there; the railroads would be making more money, and the motor truck would become very much more efficient.

HESS BRIGHT Co., 666 N. Broad Street, Philadelphia, is now located at 934 N. Broad Street.

STUDEBAKER CORP. has advised us that it is in no way connected with the recently formed International India Rubber Corp., of South Bend, Ind., and that Peter E. Studebaker, president and director of the latter company, is not now and never was a stockholder or connected in any way with the Studebaker Corp.



Samples of Traffic Delays and Congestions

On the left is traffic waiting at the West Forty-second Street Ferry and on the right the West Twenty-third Street Ferry. Note how these vehicles waiting extend out and block off other traffic

not only required to wait the regular schedule time, but often they are compelled to wait a longer period because the river traffic might be congested, the tide might interfere with the speed of the ferry, weather conditions, etc. All of these affect the speed of transportation between river points.

Millions Lost Each Year

Such conditions would not seem and be so deplorable were it not for the fact that New York and the adjoining Jersey cities are increasing and extending their commercial intercourse; and that the river fronts are becoming each day more congested with freight and freight traffic. By actual count it has been estimated that 19,660 vehicles cross the river both ways on the ferries each day, or nearly 6,000,000 a year. Also, it has been estimated that the average time lost by the average vehicle was 15 min., thus meaning that much time is lost each year by the truck owners which is loss of much money due the many idle hours the trucks wait on either side per year.

A Growing Problem Since 1868

All of this has caused the local motor truck owners to look upon this problem

boken, Bayonne, Newark, Elizabeth, etc., which are largely manufacturing centers. The reason the writer suggests tunnels is because several tunnels could be built for the same amount that it would cost to build one bridge, and the reason he suggests that they be placed below West Fiftieth St. is because 90 per cent. of the vehicular traffic on the ferries is carried on below this street.

Vehicular Traffic Tunnels

This traffic tunnel idea is not a fad or an impractical thing. Four such tunnels are now being successfully operated. One is under the harbor of Glasgow, one under the Elbe at Hamburg, and two under the River Thames, at London. The two latter ones are single tubes. The Blackwell is 6200 ft. in length and Rotherhithe is 6883 ft. long. "These two tunnels," said an engineer from London to the writer, "care for 1,000,000 vehicles a year. And that includes motor trucks and busses. They have no artificial means of ventilation and the road bed is of cobble stones." These remarks at once remove the argument that motor trucks cannot be operated in tunnels because of the gases. With artificial means of ventilation gases could be easily removed.

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Repeat Orders

There is one thing about the sale of United States Solid Truck Tires that stands out—

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It is admitted that United States Solid Truck Tires give greater service at less final cost than other tires.

Use United States Tires.

United States Tire Company

1790 BROADWAY, NEW YORK





Hurlburt Announces a Five-Ton Chassis

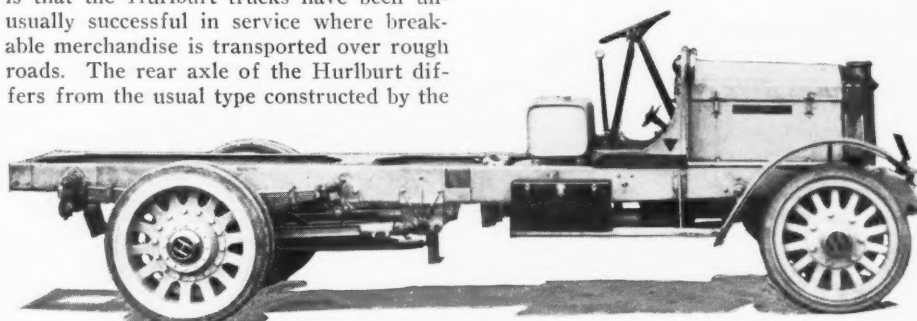
By C. P. SHATTUCK

THE Hurlburt Motor Truck Co., New York, which concern is entering its fifth year in the production of commercial cars, has augmented its extensive line by the addition of a 5-ton capacity chassis. The details of the new design have been carefully worked out, and extreme operating economy and efficiency, features of the earlier models, have been the purposes sought by the engineers of the company. The new chassis is extremely simplified and its components very accessible for adjustment or repair. The design is standardized and interchangeability of parts is one of its features. Easy and inexpensive replacement of worn parts is, in most instances, made possible by the renewal of bushings, new pins and bolts. Another important detail is the provision made for lubrication, every wearing part being properly supplied, while the bearing surfaces are ample in size.

One of the features of the Hurlburt design is the chassis frame which is the foundation of the commercial car and which is not always given the consideration it deserves. The Hurlburt frame is of the rigid type, a construction permitting of securing the body rigidly to it and without racking as the frame does not give to the inequalities of the road. The material is

constructed to meet the requirements of the frame and are sufficiently flexible to absorb all of the shock without any tendency to lift the wheels from the ground. A feature claimed of the frame suspension is that the Hurlburt trucks have been unusually successful in service where breakable merchandise is transported over rough roads. The rear axle of the Hurlburt differs from the usual type constructed by the

hand side of the engine. The fuel supply to the carburetor is through a reversible union having a strainer to prevent the entrance of foreign elements, and a cock on the float chamber permits of draining that



New Hurlburt Five-Ton Chassis

The details of the new design have been very carefully worked out, and easy, inexpensive replacement of parts subject to wear is a feature. Note the three-piece hood and substantial frame

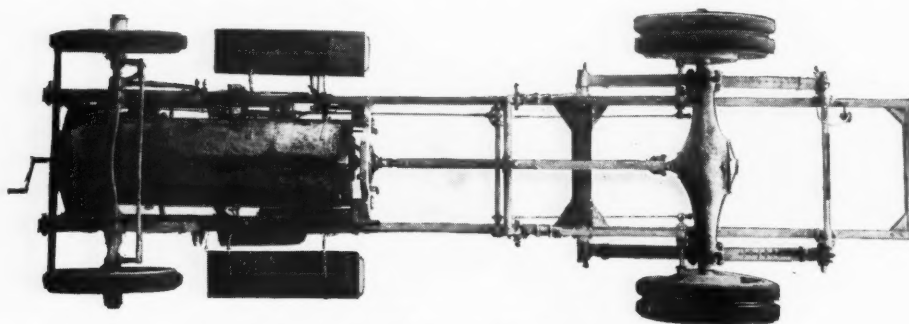
company in that it is a one-piece steel casting, and the worm and gear may be removed and replaced from the rear.

Buda Power Plant

The engines utilized by the company are Budas and that employed with the new chassis is a 6-cylinder unit known as the Model SSU. It has a bore of $3\frac{3}{4}$ in., a

member. The fuel supply is by gravity from a 24 gal. capacity substantially mounted tank under the driver's seat, and a shut-off valve is located at the right of the seat. One of the features of the tank is the filler cap. The cap proper includes a threaded member and spring which exerts a downward pressure on arms or extensions which fit and lock into recesses of the filler member. A slight turn of the threaded part and arms releases or tightens the cap, which is easily and quickly removed or replaced and positively locked. Inside of the filler proper is a recess or channel extending around the opening and having a passage through which dirt and other foreign matter may be drained. The diameter of the filler member is such that renewing the fuel supply may be accomplished in a minimum of time.

The usual spark and throttle column on the steering wheel is eliminated, control of the fuel supply being by an accelerator so designed and located that when the car is traversing rough roads that improper acceleration is prevented. The strangling device for starting, for enriching the mixture, is operated by a lever at the front of the radiator, and racing of the engine after starting is prevented by the lever automatically returning to its normal position. Control of the speed of the truck is by a governor permitting of a maximum speed



Hurlburt Frame Suspension

The frame is of chrome-nickel steel, heat-treated, and a feature of the design is a box-girder cross member supporting the radius rods and torque member

chrome nickel steel, channel sections pressed to form, and heat treated to insure extreme strength. The design and type of springs have also been very carefully considered, an important feature and one not generally understood. These have been

stroke of $5\frac{1}{2}$, and although rated at 33.75 h.p., develops 48 with its piston displacement of 364.35 cu. in.

The engine is equipped with a $1\frac{1}{2}$ in. Flechter carburetor having a low and high speed adjustment and located on the right

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Wichita Falls Model O, 3½-ton Truck, now using the Master Carbureter as standard equipment

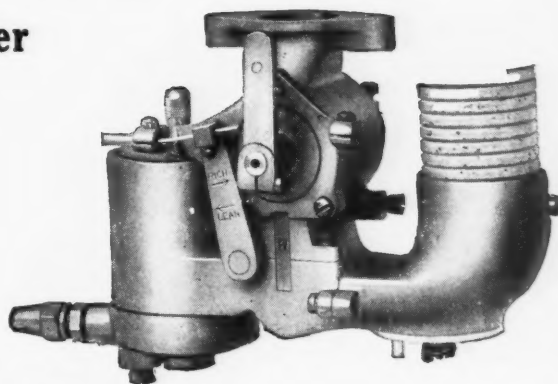
"You doubtless know that the call for your carbureters on the Pacific Coast has been pronounced, and we are very glad indeed they are giving the satisfaction they are. In view of the low-grade fuel used in many sections of the coast, we know of no carbureter that would serve the requirements better than the Master, and we assure you it is a pleasure to speak well of it."

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No matter what kind or size of truck you build, own or drive, you simply cannot afford to ignore the wonderful results obtained by hundreds of truck owners from the improved Master Carbureter. This carbureter is entirely different from any carbureter you have ever seen. Let us send you one for 30 days' free trial. Try it out under conditions of your own choosing. Put it to the severest tests—for economy, for flexibility and adaptability to all conditions of weather and temperature, for hill climbing, for rough roads, for quick starting with a cold motor. If the Master fails to deliver **more power** and **more mileage** on **less gasoline** than you have ever received from any other carbureter, return it to us at our expense. We offer the Master Carbureter on the basis of **demonstrated performance**.



The Only Carbureter that Requires

No Adjustments

Twenty-three of the foremost truck manufacturers now specify the Master Carbureter as standard equipment. Why? Because, by actual competitive tests on their own trucks, the Master gives **30% more power**, **25 to 40% more mileage**. Let us send you the facts and figures. You will never realize the highest efficiency from your trucks until you have installed a Master Carbureter.

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"Your carbureter is the one for this department. It is the nearest approach to being fool-proof of any I have ever seen. It is simply wonderful for quick starting, for surplus power and speed and for economy."—Daniel A. Sullivan, Automobile Instructor, Fire Dept. of the City of New York.

"I have tried out one of the Master Carbureters on one of our high-powered cars built here in our shops. The Master simply spells perfection when it comes to carbureters.

"My car will certainly be equipped with 'Master' and you can figure on an order for ten without further investigation."—A. L. Weeks, Chief Fire Department, City of Spokane, Wash.

"Last spring I installed a Master Carbureter on car used by me, and after giving it a thorough tryout, we equipped ten (10) pieces of fire apparatus with Master Carbureters, which are giving perfect satisfaction."—John F. Healy, Chief of Fire Department, Denver, Colo.

Steering-Post Control.

It is never necessary to raise the hood for adjustments to any change in weather, altitude or road conditions. The steering post lever gives the driver, without leaving his seat, a graduated control over the air damper—a touch of the finger instantly modifies the mixture to any texture desired. The Master eliminates adjustments under the hood—costly "tinkering" by unskilled drivers.

At this time of year especially the Master demonstrates its supremacy for quick starting with a cold motor. Trouble-proof—so simple and durable in construction that it can't get out of order. Only three moving parts, and they are wearproof.

14 Jets Instead of 3.

That's the secret of the extraordinary fuel economy. Instead of the ordinary fuel feed of 1 to 3 sprays, the Master has 14 to 21 sprays (according to size). Each spray delivers a gaseous mist, so thoroughly vaporized that the mixture gives perfect and powerful combustion. Even low-grade fuels are ground up to velvet-like smoothness, converting every particle of gas into power without carbonizing of the kerosene element.

For idling or slow running only one fuel jet is uncovered. As the Rotary Throttle revolves more jets are uncovered, **one by one**—as many as are required. Fuel consumption is economized with scientific accuracy.

Convince Yourself Mail this Coupon NOW

Tear off and mail this coupon for more information about the Master Carbureter, and free copy of valuable booklet, "Carburetion and Carbureters." With the rapidly increasing use of the Master Carbureter, every truck manufacturer, owner and driver will be obliged to decide for or against it. Why not make your decision now—if only to keep posted on developments among other truck makers and owners?

Master Carbureter Corporation
1212 West Fort St., Detroit, Michigan
Pacific Coast Branch
922-24 S. Los Angeles St., Los Angeles, Cal.

Master Carbureter Corporation,
1212 West Fort Street,
Detroit, Michigan,

You may send me, without any obligation on my part, your catalog with free booklet—"Carburetion and Carbureters."

Name.....

Address.....

Town.....

State.....

of 12 m.p.h. Ignition is by an Eisemann dual type, fixed spark magneto, located on the left hand side of the engine, and the auxiliary current supply is by an 80 ampere-hour capacity storage battery located in a steel box on the running board.

Cooling is by a centrifugal pump, tubular radiator and a ball bearing fan. The radiator is of the built-up tube type with spiral fins and resembles somewhat the Rolls-Royce design in general outlines. It is spring suspended and may be easily and quickly displaced when desired by removing four nuts. The header is substantial, though not unnecessarily heavy, of brass, and the filler opening is large. The cap is secured by a bolt and wing nut construction, easily and quickly operated. The tubes or radiator proper are suspended by rubber gaskets and can be readily displaced. Ample means are provided for thoroughly draining the contents of the pump, water jackets and radiator.

The engine is supported at three points and is well protected from the weather by the hood, which is a distinct Hurlburt design. It is made in three sections, but differs from conventional practice in that the

So successful has the company been with this type of gear that it is guaranteed for 50,000 miles of service. As previously mentioned the housing is a one-piece steel casting having a large removable plate which permits of displacing the worm and gear from the rear. The Hurlburt gear is mounted on ample capacity ball bearings, and the thrust of the worm is compensated for by similar bearings. The spindles are tubular, of $3\frac{1}{2}$ per cent. heat treated nickel steel, and are pressed into the housing. The axles are of the full floating type, and roller bearings are used.

Both front and rear springs are semi-elliptic. The front members are 40 in. long, $2\frac{1}{2}$ in. wide and have 12 leaves. They are shackled at the rear and suspended at the front end to a substantial casting which also serves as a support to the tubular bumper. The rear springs are 60 in. long, 3 in. wide and have 18 leaves. The front ends are shackled to the frame, while the rear are suspended by shackles supported by a steel tube extending through the frame. All spring shackle bushings are renewable and well lubricated. The rear spring seats ride on the spindles, not on the housings. Drive



Hurlburt Rear Axle and Springs

A Hindley type of worm and gear is used, and the rear axle is a design by the company. The worm and gear are very accessible.

sides are distinct pieces and are hinged at the bottom. The upper section is a one-piece construction and rests on supports formed in the radiator header and dash. The sides extending as they do to practically the top of the radiator permit of making inspection or adjustment to the engine without removing the hood proper. The catches are sturdy and prevent movement of the sides which swing outward when released. With this construction the entrance of water in a driving storm is prevented by the one-piece top which overlaps the sides.

The clutch is a dry plate multiple disc, steel to fabric, and easy but positive engagement is emphasized of the design. A universal joint is incorporated between it and the gearset, permitting of easy and rapid removal of the clutch without disturbing the gearset. The conventional selective sliding gearset affording three forward speeds and a reverse is employed and it provides the following ratios: Reverse 4.6:1; low, 4:1; second, 1.76:1; high, 1:1. The worm and gear ratio is 11:1. Final drive is by a hollow nickel steel shaft $2\frac{1}{2}$ in. in diameter with 3-16 in. walls. A universal joint is utilized at the rear end of the drive shaft.

Hindley Worm and Gear Rear Axle

The Hindley type of worm and gear is favored by the Hurlburt engineers because the gears have a greater number of teeth in contact, and for a given pitch, have a greater depth of tooth and a wider face.

is taken through radius rods and a torsion member.

Both sets of brakes are of the internal expanding type, 20 in. in diameter with a $2\frac{1}{2}$ in. face. The emergency member is lever operated and the lever has a notched quadrant for locking. Means are provided for easy adjustment and the renewal of worn parts. The front axle is a one-piece solid drop forging without a weld, of the I-beam section type, section $2\frac{1}{4} \times 3\frac{3}{8}$ in. The spindles are 2 61-64 in. in diameter and have ball thrust bearings. The steering gear is a Ross, and the driver is placed at the left with an H gate type of centre control. The steering wheel is rugged, 20 in. in diameter. The wheels are of the artillery type, prime hickory, are 36 in. diameter in front and 38 in. rear. The front tires are solid, 36 x 5 in., rear dual, 38 x 6 in. Wheel bearings are roller.

The frame is 34 in. wide and its length is dependent on the body design. The standard is 18 ft. and has a section of $8\frac{1}{8}$ in. and $2\frac{1}{2}$ in. flange. It tapers from a point about $6\frac{1}{8}$ ft. from the front and about $5\frac{1}{2}$ ft. from the rear. Two wheelbases are supplied, 156 and 170 in., with the former standard. The cross members are of the same material as the frame and the member supporting the torque arm and radius rods is an unusually rugged construction. It is of wide channel section and has large gusset plates so arranged as to form a box girder effect. Nickel steel rivets are hot riveted through the cross

member and gusset plates, and in securing all cross members.

Electric Lighting

Lighting is by electricity, a storage battery being maintained in a properly charged condition by a Westinghouse generator. The lamps include two side members set flush in the dash and a tail member. The lamps normally provide about the same volume of illumination as ordinary oil members, but the volume may be largely increased by a movement of the switch, and it is stated that the rays will illuminate the road at least 200 yards ahead. The dash also carries the ignition switch, speedometer and ammeter. Provision is made for conveniently plugging in an electric trouble lamp. The usual horn, jack, tools, etc., are provided, also special wrenches, oil gun and oil can.

The standard chassis has an overall length of 19 ft. $\frac{3}{4}$ in., and the 170 in. wheelbase a length of 21 ft. 3.4 in. The tread is 64 in. and the overall width at rear hubs 6 ft. 6 in. The distance in back of the driver's seat of the standard chassis is 11 ft. $4\frac{1}{2}$ in. That of the longer wheelbase is 13 ft. $4\frac{1}{2}$ in.

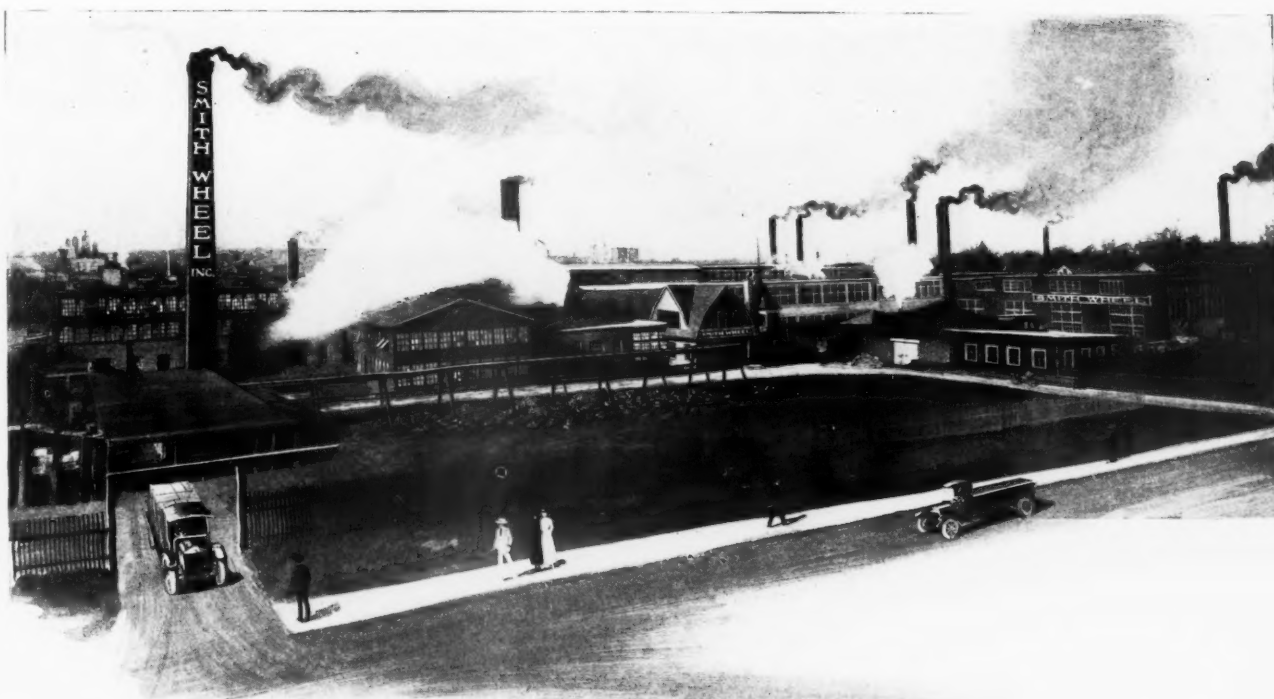
Attention has been given to minor details such as the running boards, fenders, etc. The former are of kiln dried oak covered with aluminum matting, and the fenders are of heavy steel and well anchored. The forward end of the front members have a slip or extension which slips over the bumper bar. The chassis which has a capacity of 12,500 lbs., comes in a priming coat and sells at \$4250.

In addition to the 5-ton truck described the Hurlburt Motor Truck Co. is manufacturing trucks of the following capacities: $1\frac{1}{2}$, 2, $3\frac{1}{2}$ and 7-ton. With the exception of the last named all are equipped with 4-cylinder engines, and the description of the components of the 5-ton model will apply to all, differing only in the dimensions and a four speed gearset utilized in the 7-ton model.

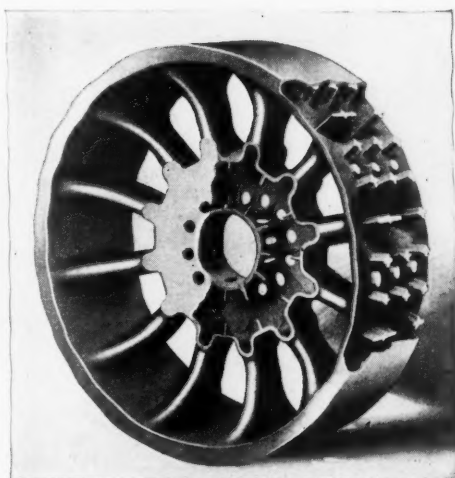
METZ ONE-TON TRUCK CHASSIS

Recent announcement by the Metz Co., of Waltham, Mass., discloses a new one-ton truck chassis to sell at \$695. This chassis has a $3\frac{3}{8} \times 4$ in. engine, the Metz gearless transmission, internal gear drive and 130 in. wheelbase. The frame is of 5 in. heavy channel steel. Other details are as follows: tread, 56 in.; ignition by magneto; front tires, 32 x $3\frac{1}{2}$ in. pneumatic; rear tires, 34 x $3\frac{1}{2}$ in. solid; capacity, 2000 lbs.; gasoline capacity, 15 gals.; weight, 2500 lbs.; speed, up to 20 m.p.h. The frame from the rear seat to the rear frame end is 8 ft.

SELDEN MOTOR TRUCK SALES CO., Rochester, N. Y., on December 28 declared a semi-annual dividend of $6\frac{1}{2}$ per cent. on the preferred stock. The company will establish a Pacific coast department at San Francisco covering the far western states in the early part of the year.

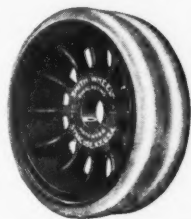


Home of the Smith Wheel

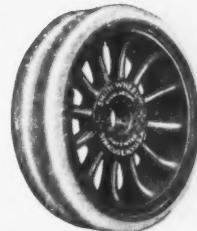


Smith Wheels, "Everlasting," Internal Construction

Tire Mileage Increased—Gasoline Mileage Increased—Truck Life Increased



**Smith Wheels Guaranteed during LIFE
OF TRUCK on which originally placed.**



Smith Wheels Make Trucks More Saleable

Made for Trucks of any
size and to fit any axle.



We will prosecute any manufacturer
of a wheel of hollow spoke design, or
of a type having a felloe with inter-
nal braces, for infringement of our
Patent Rights.

When Writing, Please Say—"Saw Your Ad. in the CCJ"

ZEITLER & LAMSON TRUCKS

A modern factory has recently been constructed at 4642-46 W. Madison Street, Chicago, Ill., where the Zeitler & Lamson trucks are being manufactured. The company specializes in the custom made job and has concentrated their efforts on the 1½ and 2½-ton models. These trucks are of improved design and embody such standard parts as Wisconsin engine, Cotta transmission and Sheldon axles.

One and a Half Ton Model

The 4 x 5 in. Wisconsin engine used in this model develops a maximum of 41 h.p. Installation of this engine has been the subject of a number of detailed refinements in the trucks which are intended to give long life and greater efficiency. The adoption of electric lights, including generator and large battery, Bosch D U-4 magneto and Stromberg HI carburetor are prominent examples.

A 10 in. Borg & Beck clutch in conjunction with the transmission is enclosed in a

drive rear axle is specified. This axle incorporates the David Brown worm and gears and 16 x 3 in. oversize brakes.

Other Specifications

Pressed steel frame 5¼ in.; 2¼ x 40 in. front springs; 3 x 56 in. rear springs; front tires 36 x 3½ in.; rear tires 36 x 5 in.; loading space 8 ft. and 9½ ft. Price, \$1850 f.o.b. Chicago, Ill.

Two and a Half Ton Model

The 2½-ton model differs but slightly from the description given above. Tires, for example, are heavier. The front set are 36 x 4 in. and the rear 36 x 7 in. The engine is a Wisconsin, having a 4 in. bore and 6 in. stroke. The price is \$2450 f.o.b. Chicago, Ill. Equipment for both models includes double bulb headlights, storage battery, generator, electric horn, Duplex governor, complete set of tools and hub-o-meter.



Two and a Half Ton Zeitler & Lamson Truck; Chassis, \$2450

Has Wisconsin engine, Cotta transmission, Borg & Beck clutch, Ross steering gear and Sheldon axles

dust proof housing. This clutch is of the 3-plate type, of advanced design and is easily adjusted. The Cotta transmission is of the unit power plant type with three speeds forward and one reverse. Gears run continually in mesh.

Axles

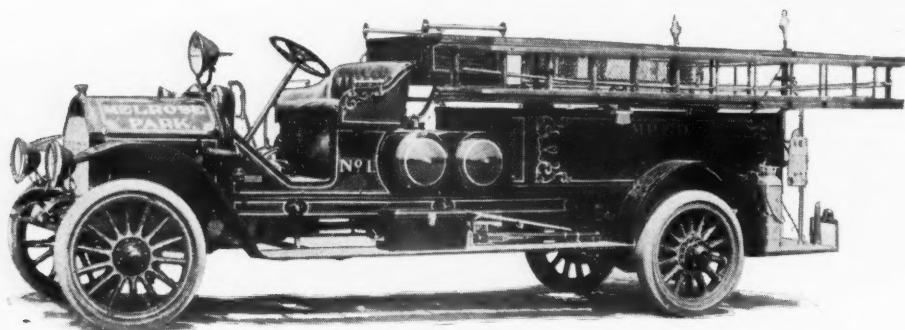
The front axle is a Sheldon product made in I-beam sections; bed and knuckles are drop forged from 3½ per cent. nickel steel, heat treated. Wheel bearings are of the taper roller type, with ample adjustments. A Sheldon semi-floating worm-

The Interstate Series TC

This parcel body of 850 pounds capacity is mounted on the pleasure car chassis. It has double rear doors.



pressed steel channel section, of 3½ x 5-32 in. material. The radiator is a Fedders honeycomb type. The gasoline tank is located under the cowl, with its filler cap under the hood.



Zeitler & Lamson Two and a Half Ton Model

Fitted with fire-fighting equipment and in the regular service of the Melrose Park Fire Department

SERIES TC INTERSTATE COMMERCIAL CAR

The Interstate Motor Co., Muncie, Ind., offers the Interstate Series TC parcel delivery car at \$850 for the coming season. This model consists of a parcel body mounted upon the pleasure car chassis, making this model adaptable to grocers, florists, confectioners, etc. The loading dimensions are: Width inside the body at the top, 46 in.; width at the bottom, 42 in.; height, 51 in.; length from seat to doors, 65 in. The body is finished in green, wheels are cream color, striped with winton green and running gear is black. The price includes full equipment.

Power Plannt

The engine has four cylinders, cast in block, with overhead valves, cylinder head being removable. The bore is 3½ in., stroke 5 in. The transmission is selective and mounted on the rear axle. The clutch is a leather-faced cone. The carburetor is a 1 in. Schebler and ignition is by the Remy system. Lubrication is by a circulating splash system with gear driven pump.

Brakes are internal and external, operating on 12 x 1¾ in. drums. The front axle is a drop forged I-beam section, the rear being floating with bevel gear drive. The gear ratio is 4:1. Hyatt roller bearings are used.

Goodyear 33 x 4 in. non-skid tires are supplied on the rear wheels, and plain tread of the same size on the front.

The front springs are 36 x 1¾ in. semi-elliptic, the rear being 46 x 2 in. three-quarter elliptic. Steering is from the left side and the control levers are in the center. Drive is by enclosed shaft. The tread is standard. Wheels are wood, with twelve 1¾ in. spokes, and are equipped with Firestone demountable rims. The frame is

INDEPENDENT OIL MEN'S ASSOCIATION, Chicago, Ill., will hold its second eastern conference at the New Willard Hotel, Washington, D. C., on January 23 and 24. One of the suggestions to be considered at this time will be the increased use of kerosene in internal combustion engines. For further particulars address E. E. Grant, secretary, Westminster Bldg., Chicago, Ill.

For its readers—information; for its advertisers—results. That's the purpose of the CCJ

Maxwell One-Ton Chassis, \$795

By LEN G. SHAW

MAXWELL Motor Co., Inc., Detroit, Mich., has entered the commercial car field with a 1-ton truck, an announcement that is of unusual interest to the trade, in view of the prominent position the company occupies in the pleasure vehicle realm, and the experience and manufacturing facilities back of the move. That everything has been planned on a large scale is shown by the assertion of President Walter E. Flanders that the company expects to build and sell 25,000 of these trucks the coming year.

The newest Maxwell is a full-fledged truck in the broadest sense of the word. The only suggestion of the regular Maxwell line is found in the power plant, which with a few unimportant exceptions, is the same as employed in the pleasure cars put out by the company. There is nothing radical about the 1-ton Maxwell truck. Standard practices have been followed throughout, although virtually everything entering into the truck is made in the company's plants, so that it is essentially a home product. The regular chassis includes front fenders and running board, solid tires, 32 x 3 in. front and 32 x 4 in. rear; electric headlights and tail light, electric horn, generator and storage battery of 80-ampere hour capacity, and full set of tools. The price of the chassis in this form is \$795. Bodies are furnished to order, a box body with cab and windshield costing \$55, express body with integral cab, side curtains and windshield, \$95, and panel body with integral cab and windshield, \$105. If desired, 33 x 4½ in. pneumatic tires, with demountable rims on all four wheels, will be furnished for \$30 extra.

Power Plant

The power plant which, as already noted, is practically identical with that used in the

accessibility, coupled with simplicity, is a pronounced attribute of the power plant. Lubrication is splash, with positive pump delivering oil direct to the front and rear main bearings and maintaining a constant level in the splash pan. Ignition is through an Auto-Lite generator located on the left side of the engine, well forward, with Prest-O-Lite storage battery. Cooling is thermo-syphon, water connections being of generous dimensions, with a belt-driven fan mounted on self-adjusting bracket.

A special atomizer-type carburetor is used, with dash adjustment that can be instantly regulated to meet any climatic or running conditions.

The cone clutch is faced with multibestos lining and runs in oil. Transmission is of the familiar three-speed selective type, enclosed in a case which is bolted to the fly-wheel housing. The main shaft has roller

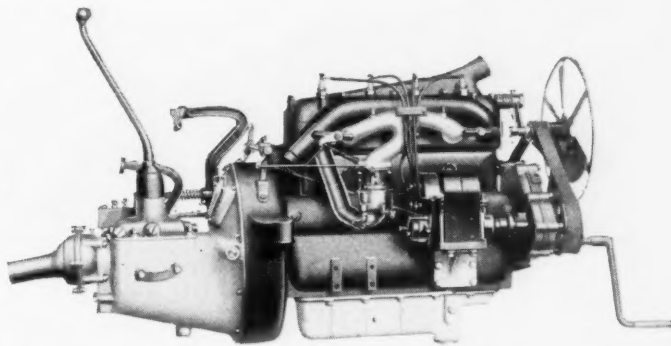
drive shaft. The housing is malleable iron, roller bearings being used throughout the rear and front axles.

Front Axle

An I-beam drop forging, with spring pads integral, constitutes the front axle, which is dropped in the center with an 11 in. clearance.

Both sets of brakes operate in the rear wheel drums, being internal expanding. They are 13½ x 1¾ in. in size, the service being pedal actuated and the emergency operating through a lever. The steering gear is an irreversible worm, practically the same as employed on the touring car save that instead of the drag link being athwart the car it is fore and aft. The wheel is 18 in. in diameter, with spark and throttle control and horn conveniently placed on

Right Side of Maxwell One-Ton Truck Power Plant



bearings in the front end and bronze bearings at the rear.

From the gear case power is conveyed to the rear axle through a two-piece shaft, the front section extending only to the middle cross-member, where it is held securely in place. From here double universal and telescopic joints of the company's own de-

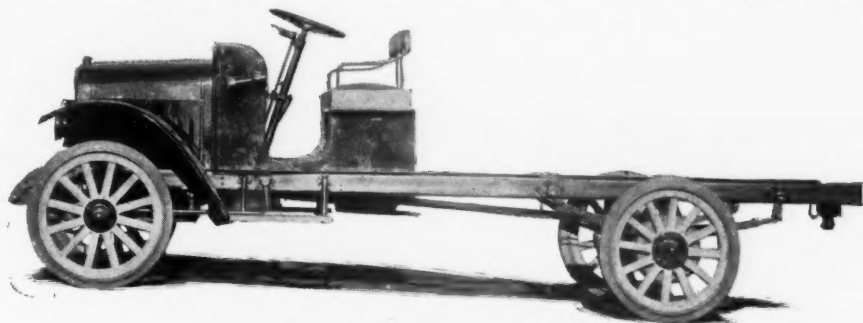
the column. It is on the left side, with center gear control.

The frame is substantial, being 3-16 in. gage pressed steel channel, longitudinal sections, with four heavy cross-members that give great rigidity. The maximum depth of the side members is 4 7-16 in., and the flanges have a maximum width of 3½ in. The forward springs are 38 x 2¼ in., and the rear, 52 x 2¼ in., both sets being semi-elliptic. They are heavily shackled at the rear.

The frame has a length over all of 188 in. on a 124 in. wheelbase. Of this 102 in. is back of the driver's seat, this placing approximately 75 per cent. of the load on the rear springs, which is counted a fair proportion. The chassis weighs approximately 2,400 lbs.

Body dimensions vary somewhat because of the different types, but the panel body with integral cab can be taken as representative. This has a length inside, back of the seat, of 8 ft. 5 in., and inside width of 3 ft. 9 in.; and a height of top from body floor of 4 ft. 10 in. This gives an overall height for the truck of 7 ft. 7 in. The driver's seat has a width of 3 ft. 9 in. and a depth of 18½ in. The depth from the seat to the dash is 27 in.

Beneath the cowl is located the 11 gal. tank, from which gasoline is fed by gravity to the carburetor. Wheels are of artillery type, with steel rims. The standard color is black body with red wheels.



The New Maxwell Truck Chassis, \$795

The chassis has a wheelbase of 124 in., and seventy-five per cent. of the load is carried on the rear wheels. It has solid tires all around, and worm-gear drive

pleasure cars, is of unit type, with four-cylinder engine, cone clutch, and with selective three-speed transmission.

The engine bore is 3½ in.; the stroke, 4½ in. Valves are 1 9-16 in. in diameter, located on the right side and completely enclosed. Cylinders and crankcase are cast integral, with detachable cylinder head that gives ready access for removing carbon or inspecting cylinders and valve heads. Indeed

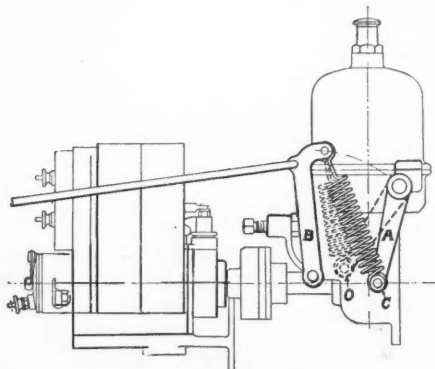
sign and make and a substantial shaft connect with the worm gear, through which final drive is obtained.

Although the worm and gear drive embodied in the rear axle is Timken-David Brown type, with Timken axle bearings, it is made in the Maxwell plant. The problem of stability in this quarter appears to have been successfully worked out by the employment of a 2½ in. chrome-nickel

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

A NEW HEAVY-DUTY KREBS THREE AND A HALF TON TRUCK

The Krebs Commercial Car Co., Clyde, O., is manufacturing trucks for all purposes. The new model 90 worm drive job is an unusually massive chassis with am-



The Krebs Governor

Showing the governor set for high speeds. Lever A controls the throttle. When it is in the position C the throttle is closed, and when at O it is open. The centrifugal force of the weights acting on a lever inside the case tends to close the throttle, but this force is balanced by the pull of the spring.

ple wearing surfaces, and is designed with a large factor of safety. Its construction embodies such standard parts as Continental 4-cylinder engine, Bosch high tension magneto, Brown-Lipe 4-speed selective transmission, Ross steering gear, Timken-Detroit axles, the rear being full floating and equipped with Timken-David-Brown worm gears.

The feature of the Krebs line is the automatic variable governor, fitted to all models. This device opens the throttle as wide as needed to maintain the speed on a hard pull and closes it to prevent greater speed when the going is easy or when the clutch is released. In the Krebs governor one spring is adapted to all speeds by changing its relation to the other parts of the governor. The driver has no control of the engine speed except through this device.

Frame

The new 3½-ton models have a pressed steel frame ¼ in. thick, 8 in. deep and

with flanges ¾ in. wide tapered at each end to give the greatest strength where needed. It is thoroughly braced and fastened with ½ in. rivets.

The springs are semi-elliptic all around, 44 x 3 in. front and 60 x 3½ in. rear. Rear spring bolts are 1½ in. in diameter by 3½ in. long, with other wearing parts designed in proportion.

The Krebs radiator represents the most modern developments in advanced design. It is built with 224 vertical copper tubes ⅜ in. in diameter and cast iron tanks, the whole firmly bolted together with vertical rods and held in position on the frame by suitable coil springs. The entire construction is conducive to the best results under the most exacting conditions.

Other specifications include dry plate clutch, right or left hand drive, internal service and emergency brakes, 180 in. wheel-

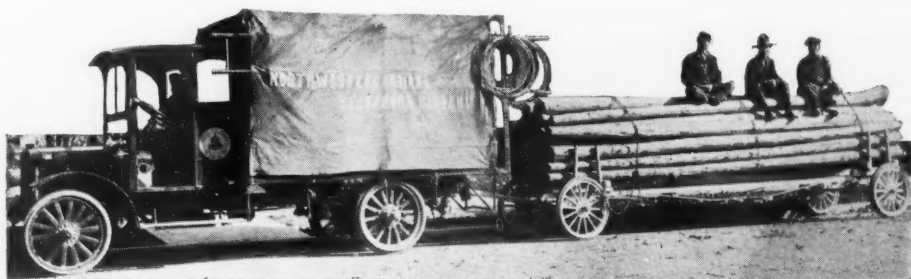
base, chassis weight 6325 lbs., maximum speed, 15 m.p.h. Price of chassis in the lead, \$3250.

Krebs trucks are offered in 1½, 2 and 3½-ton capacities.

COLGATE USES STUDEBAKERS

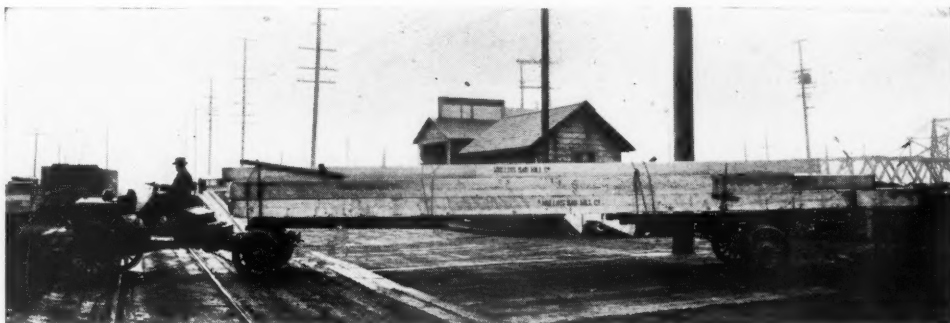
In the December issue on page 66, under an illustration in the first column, we inadvertently stated that the Colgate Co. employs seventeen Reo 1500-lb. capacity cars. The cars used, however, are of Studebaker make, as shown in the illustration.

CHAMPION MOTORS Co., Inc., Fulton, Ill., has secured a large display room at 1456 Wabash Avenue, directly opposite the Coliseum in Chicago, in which it will exhibit its light delivery cars during the Chicago show.



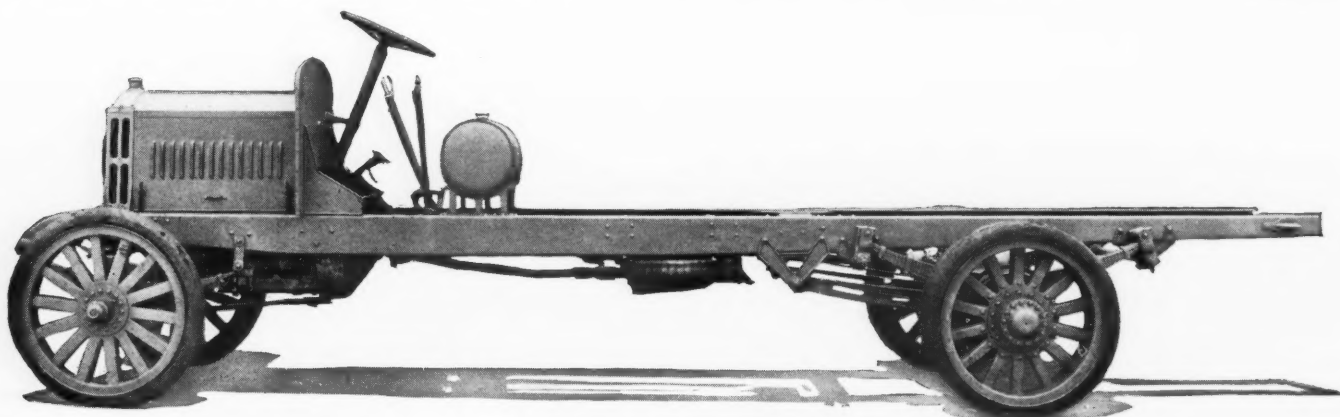
One of the Possibilities of the Trailer in Telephone Work

This illustration shows a Sechler Trailmobile, made by Sechler & Company, 538-50 East Fifth Street, Cincinnati, Ohio, hauling twenty-eight 20 ft. telephone poles, which weigh slightly over 3,000 lbs. The Northwestern Indiana Telephone Company, which is using this outfit, states that the use of a trailer in this service soon saves the original cost, and solves the matter of transporting and distributing poles.



This Combination Carried 12,348 Pounds

Just a few sticks of lumber being hauled by a Wichita three-ton tractor-truck, built by the Wichita Falls Motor Company, of Wichita Falls, Texas. The length of the lumber is 42 ft., consisting of seven pieces 12x12.



The Krebs Truck

Made in one and a half, two, and three and a half ton capacities. Standardized parts enter largely into the manufacture of this line

Advertising appropriations bring greatest returns when expended in the CCJ



"I'm building a good Business on-"

American
HAMMERED
Piston Rings

They're LEAK-TIGHT

SO write us several of our agents, and there is truth and sincerity in what they say. Auto Accessory salesmen who have been dribbling along for years on small sales and smaller profits, have found a gold mine in AMERICAN HAMMERED PISTON RINGS.

A little earnest work and diligent plugging has earned more money for them in the past six months with AMERICAN HAMMERED PISTON RINGS than they have made in an entire year with any other automobile accessory.

YOU can do the same.

If you are a garage owner, if you deal in automobile accessories, or if you are just looking for an opportunity to establish a profitable business for yourself, write us at once. We are sure that we can do something for you, if you are a HUSTLER.

There is the strongest kind of reason why our agents and dealers should make big money.

One of these reasons is the fact that the AMERICAN HAMMERED PISTON RING has been adopted exclusively by such noted manufacturers as PIERCE-ARROW, CHALMERS, WINTON, MERCER, STEARNS, LOZIER, INTERNATIONAL, WHITE and KELLY-SPRINGFIELD.

Do you want any better guarantee of the salableness of AMERICAN HAMMERED PISTON RINGS than that?

Here are some further guarantees, as "leak-tight" as the AMERICAN HAMMERED PISTON RING itself:

They are guaranteed to increase the motor power of any car or truck 10% to 30%.

They are guaranteed to increase the mileage from gasoline by 25% to 50%.

They are guaranteed to reduce oil consumption by 50% to 75%.

They are guaranteed to prevent spark-plug trouble, carbon trouble and smoking.

They are guaranteed to keep the cylinders from getting out of true.

Our Money-Back Guarantee

We guarantee all the results here specified, and if the purchaser is not altogether satisfied any time within one year after installing a set of our rings, he has the privilege of returning the rings and we will refund his money.

All that we claim for AMERICAN PISTON RINGS has been proved by practical tests. That is why we say **these rings are a necessity, not a luxury.**

We Want Dealers and Agents

To enterprising men we will allot exclusive territory. The great reputation of AMERICAN HAMMERED PISTON RINGS makes them easy to sell.

The AMERICAN HAMMERED PISTON RING can be installed in any Truck or Pleasure Car and no matter what style motor it may be, and they will pay for themselves quickly in the saving of gasoline and oil alone.

We will give all the assistance and aid to our agents that is possible. We advertise extensively, and all replies and inquiries about the AMERICAN HAMMERED PISTON RING are turned over to our agents.

We have a special ring for Ford Cars at a special low price. Do you understand what that means?

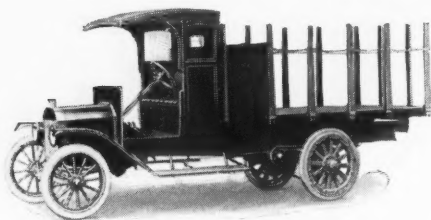
If you want exclusive sales rights to the AMERICAN HAMMERED PISTON RINGS in your territory write us at once. We will help you build a well-paying business.

Send for our Instructive and Interesting Booklet, "The Soul of a Motor"

AMERICAN PISTON RING CO. Dept. C. NEWARK, N. J.

PARRY COMMERCIAL BODIES

The Parry Mfg. Co., of Indianapolis, Ind., makes several types of commercial bodies, the newest among these being the No. 218 suburban vestibule panel body, illustrated herewith. This body is especially adapted

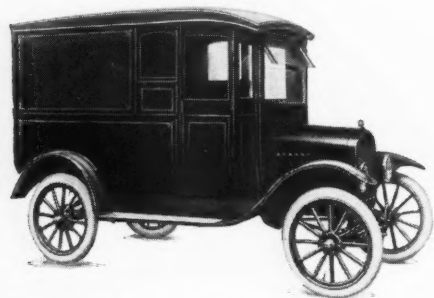


No. 511 Platform Body

This body is fitted to Ford chassis which has been converted into a truck. Stakes are removable

for cold weather delivery, as the driver is entirely enclosed. In addition to bodies for the standard Ford chassis it makes bodies adapted to extended Ford chassis and the converted Ford chassis.

Some other bodies manufactured are the No. 205 express body with express top; No. 500 express body with cab seat for the



No. 218 Suburban Vestibule Panel Body

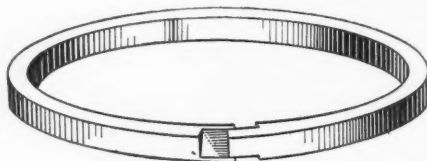
converted Ford chassis; No. 208 slip-on body for Ford roadster; No. 212 New England panel body.

The No. 511 platform body with removable stakes, shown herewith, has specifications as follows: loading space back of seat, 60 x 112 in.; seasoned hardwood; metal strip protectors; sign board permanently attached to front stakes; rear stakes removable; painted orange chrome with appropriate striping equipment, body and cab seat; weight, 650 lbs. This body is for the converted Ford chassis.

"GAS TITE" PISTON RINGS

The Bilt-Rite Specialty Co., of Moberly, Mo., is making "Gas Tite" piston rings in any desired size. The accompanying cut helps one to understand its construction and operation. Note it is a one-piece concentric form, the joint being milled to form transversely oppositely inclined abutting ends, inner cut extending past center of ring thickness and outer cut not reaching center to correspond and fit together. This should make a gas tight seal regardless of wear. A small opening leading under ring on pressure side, allows gas to get under

ring and expand it, according to the load engine is pulling, thereby making a quick acting ring. The other edge, however, has no outlet to allow gas to get past; or for



A Sensitive Piston Ring

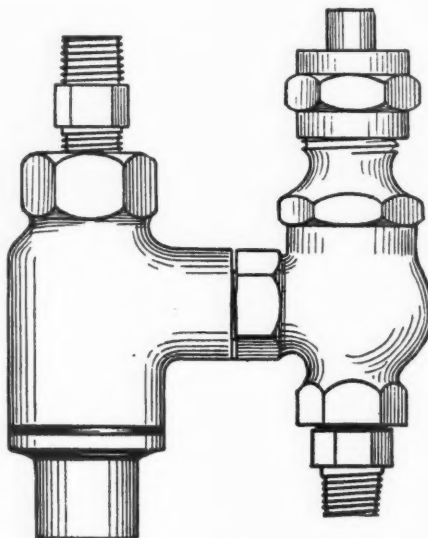
The illustration depicts a simple piston ring which, according to the distributors, insures an engine of greater load capacity, stops smoking, irregular ignition and excessive carbon deposits.

oil to be sucked up through on the intake stroke. The joint is milled on arc of ring and fits perfectly. Soft gray iron is used and the rings are closed and ground under water to exact size.

Price \$.50 under 5 in.

VANDEWATER CARBON DECOMPOSER

The Vandewater Engineering Co., of Elizabeth, N. J., is offering the Vandewater Carbon Decomposer for removing carbon



Carbon Decomposer for Auto Cylinders

Shown above is the Vandewater Carbon Decomposer for attachment to cylinders of automobiles. It is said to save gasoline to the extent of approximately twenty per cent.

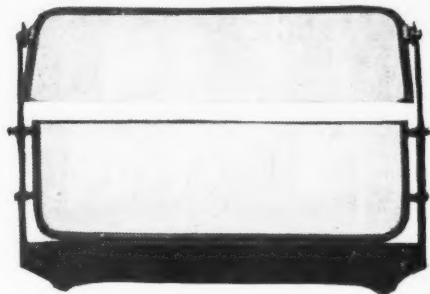
from cylinders of automobiles, by means of steam. Steam mixed with the charge in an automobile engine is claimed to oxidize the finely divided particles of incandescent carbon at the time of the explosion, and prevents the formation of carbon deposit. This device is automatically controlled by the vacuum produced by the pistons and is claimed to require setting only once as no air is admitted through the decomposer, therefore no change takes place in the mixture. The needle valve in the carburetor may require turning off just a little.

The price is \$5.

Merit wins—that's why the CCJ is the leader

BANKER WINDSHIELDS FOR TRUCKS

The Banker Windshield Co., Ellsworth & Negley Avenues, Pittsburgh, Pa., is offering the model 11 Rain Vision truck shield and the model 3 truck shield. The former is designed especially to meet the requirements of commercial cars or trucks; being



Banker Model 11 Rain-Vision Truck Shield

The upper fold of this shield can be adjusted to any angle desired for rain vision or ventilation. It is finished in three coats of black enamel, baked on. The glass is set in high-grade channel rubber. Shields are supplied complete with or without filler board.

built of extra heavy material throughout, it is said to be practically indestructible and affords a maximum of protection. Construction embodies high grade steel tubing, plate glass and channel rubber. The hinges are of the friction type and by a slight turn of the wing nuts the upper fold can be adjusted to any desired angle for rain vision or ventilation. The model 3 truck shield is constructed of brass throughout

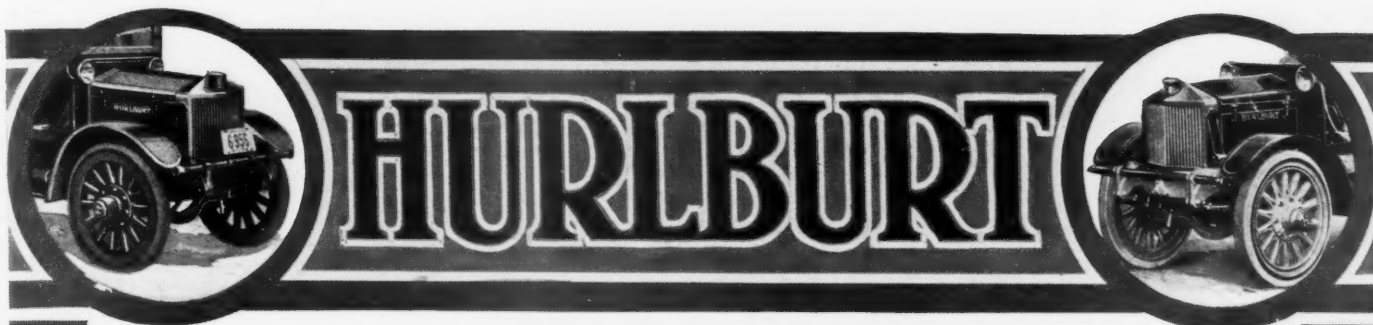


Banker Model 3 Truck Shield

This shield is made of round brass tubing, highly polished, with $\frac{3}{8}$ x $\frac{3}{8}$ inch groove. The adjustable feature operates on ball ratchet hinges, locking automatically in all positions.

to meet the requirements of manufacturers, where steel frame shield is not desirable. The shield operates on ball ratchet hinges, adjustable at any angle to a complete half fold, locking automatically in each position.

SIGNAL MOTOR TRUCK CO. OF NEW ENGLAND, New England distributor of Signal trucks and Atlas delivery cars, has opened salesroom and service station at 949 Commonwealth Avenue, Boston, Mass.



QUALITY

After four years of successful selling in the metropolitan market, we have decided to offer a limited number of Hurlburt Trucks throughout the country.

In bringing the Hurlburt Truck to the attention of the dealers in this country, we want them to consider, first of all, the underlying principles of our success. These have been the quality of materials used in these trucks and the exceptional records of economy that these trucks have made.

We are using the finest materials obtainable, and we know that the skill used in producing them is second to none.

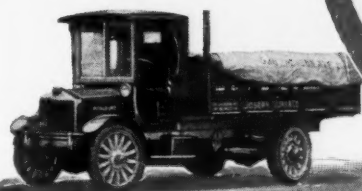
We have sold a number of representative concerns, of which the following is a partial list: Standard Oil Co., Board of Education of N. Y., New York Police Department, Holbrook, Cabot & Rollins Corp., Tiffany Studios, Hecker-Jones-Jewell Milling Co., John Wanamaker, General Chemical Co., Bordens Milk Co., and Adams Express Co.

For this reason: That the Hurlburt Truck has an unequalled record of performances; we believe that we present to the dealers of this country a most interesting dealer proposition.

This complete plan, which includes all kinds of co-operation for the dealer, is at your disposal.

We would advise you to write or wire us at once.

Hurlburt Motor Truck Company
133rd Street and Harlem River
New York, N. Y.

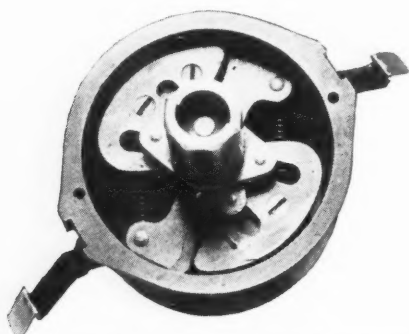


When Writing, Please Say—"Saw Your Ad. in the CCJ"

THE ERICSSON IGNITER

The Ericsson igniter is a simple mechanism claimed to be practically fool-proof and wear-proof and easy to understand and to repair.

The Ericsson igniter is noteworthy on account of its ability to conserve current. By a patented self-governing construction of the cam, which makes and breaks the circuit, the circuit is kept open a relative-



The Ericsson Igniter With Cover Removed to Show the Internal Working Parts

ly longer interval when the engine is at high speed, and a relatively shorter interval when at low speed. In this way the current is given to the spark plugs in accordance with the current requirements based on the rates of speed. With the Ericsson igniter the amount of current consumption, in relation to the speed, remains about uniform. The dilemma of having too much current at low speed, or too little at high, is eliminated.

The constancy of current consumption, which features the new Ericsson igniter, is accomplished by means of two cams which are superimposed and connected to centrifugal governors. As the governors move outward or inward, in proportion to the speed, the angular relationship between the cams varies. The fibre bumper is of sufficient width to rest on both cams at once, and as the cams separate from each other, the duration of contact is increased. This reaches its maximum at any predetermined high-speed condition, and from this point to the minimum speeds the cams move so as to gradually get in line where the minimum opening occurs.

As is natural, this centrifugal principle can be applied to produce a very satisfactory form of automatic advance. In such a case both the rear cam and front cam move forward, timing the spark in proportion to the engine speed. If, on the other hand, a manual advance is desired, the front cam moves forward and the rear cam remains fixed. The automatic advance can readily be adapted to the needs of the particular engine on which the Ericsson igniter is used, and, once determined, it will never vary. The reason for this is that this automatic advance depends entirely on the shape of two slots in the igniter, and, as these covers are made from steel punchings, there is no possibility of variation.

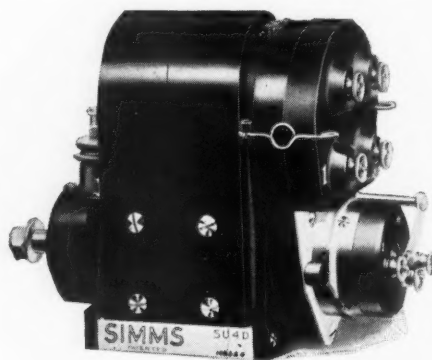
In the construction of this igniter, simplicity, accuracy and strength have been the determining factors. The metal parts

are largely punchings and die castings. The breaker arm is made of sheet steel and formed so as to provide a maximum strength with a minimum weight. The contacts are especially large and are manufactured either of tungsten or platinum iridium, depending on the characteristics of the installation. The distributor system is manufactured of electrose, and is of the jump spark type. This means that there are no carbon brushes used, and therefore no trouble due to carbon deposit on the path of the distributor. The cable connectors combine simplicity and ease of attachment with strength and electric protection. These igniters are at present manufactured for 4, 6 and 8 cylinder engines, having a crankshaft speed of 3500 r.p.m. Twelve cylinder and 2 spark igniters are under consideration.

SIMMS TYPE SU4D DUAL MAGNETO

The Simms Magneto Co., of East Orange, N. J., offers several types of high tension magnetos, popular among these being the Type SU4D. This is the true high tension type in which current is both generated and transformed in the rotating armature without the introduction of any exterior devices.

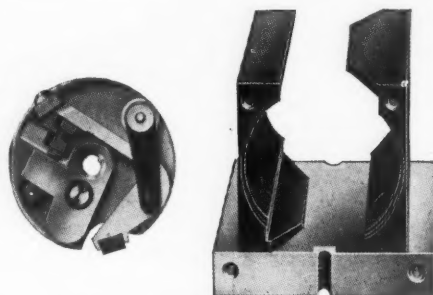
The variation in timing is accomplished on the magneto armature itself, and due to



Simms Type SU4D Dual Magneto

the Simms Patented Extended Pole Shoe; the spark, at low speeds, is most intense in the retarded position, while the greatest spark efficiency, at high speeds, is caused to occur in the fully advanced positions.

The cam, which actuates the contact breaker, is made of one piece of steel, hardened and accurately ground. This insures perfect synchronism and prevents any uneven wear.



Simms Contact Breaker and Extended Pole Shoes

Three oilers are provided, one on the driving end plate, the other two at the top of the distributor end plate. These oilers lubricate all bearings in the magneto and should be given three to four drops of light machine oil, every thousand miles. Care should be taken not to over-lubricate, and the contact breaker itself should never be oiled. The extended pole shoes are claimed to give intense spark at full retard or full advance, without sacrificing efficiency in either position. The contact breaker takes advantage of centrifugal force at high speeds, which tends to produce sharp and rapid breaks at the platinum-iridium points.

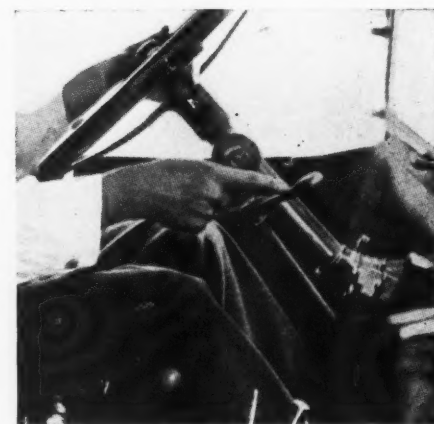
A NON-SKID SANDER

The Surface Grip Corp., Inc., of 5-7 West German Street, Baltimore, Md., have designed a device which, when attached to an



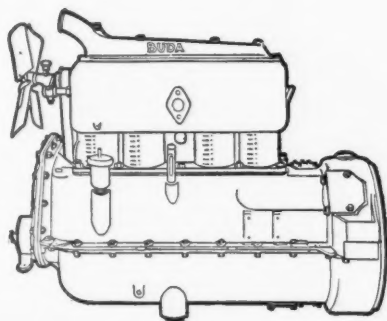
Close View of the Sander's Pipes

automobile, either pleasure car or motor truck, enables the operator to project sand or other gritty substances in front and on the inside of the rear wheels. The operation of this non-skid device may be regulated as to direction, by adjusting the outflow pipes as may be desired, but usually the sand or substance used is allowed to fall in front of and on the inside of the rear wheels, slightly over one-half of the tread being covered. The device is made of met-



Controlling Lever Location for the Sanders

al; the two sand boxes, one on either side, are inclosed and are said to be air tight and moisture proof. The pull, by the operator of a lever, which is in access to his right hand, raises the valves and allows the sand to flow, and when the lever is released the valves close and the escape of material is stopped.



REPUTATION: It is one thing to have a reputation and sometimes quite another and a very different thing to deserve one.

ESTABLISHED, and therefore deserved, is the high repute of the Buda Motor. It is based on reliable, long-lived, economical, efficient performance, the result of 36 years of the highest grade of manufacturing.

The BUDA MOTOR

is an expression of our one ideal—Quality; and this is attained through conservative engineering plus conscientious workmanship and the fact that—

OUR CAPACITY, though large, has grown solely on the basis of the number of motors we could produce carefully, test thoroughly, guarantee positively. It is kept squarely on that basis. When a BUDA MOTOR goes into your assembly our reputation goes with it. We cannot afford to forget that, and—*neither can you.*

THE BUDA COMPANY, HARVEY, (Chicago Suburb) ILLINOIS



A FOUR-WHEELED GROCERY STORE

About a year ago E. E. Moseley, of Pine Bluffs, Ark., conceived the idea that if a peddler traveling from house to house through farming sections with a plodding team hitched to a wagon-load of groceries could make money, a grocery store built on a motor truck would pay good dividends going from house to house through the streets of Pine Bluffs.

Accordingly he purchased a 2-ton Reo truck and had a body built thereon 16 ft. long, 6 ft. wide and 6 ft. 2 in. high. There is a customers' vestibule in the rear with ample standing room for six people besides a vegetable case. An ice box forms a part of the counter when closed. The other half of the counter is hinged and turns back over the ice box to permit the opening of a slatted gate beneath.

A confectionery case reaches from the counter to the ceiling. Drawers and shelving were built along the sides with space for display boxes and baskets. Rods hold the merchandise on the shelves and they automatically fall back into place after being removed to get at the goods. One section of shelving is covered with heavy gauze wire shutters for the same purpose.

The driver's compartment is separated from the sales room with a partition, screen door and window. All doors and windows are screened and provided with drop sash.

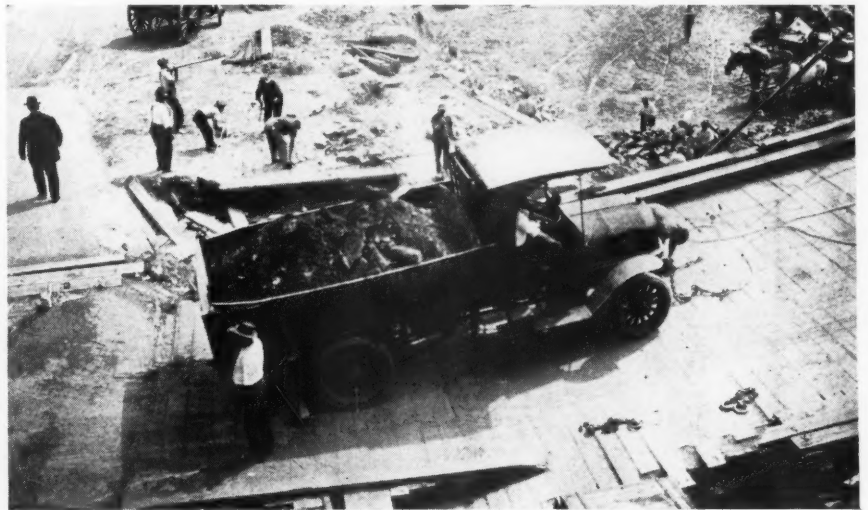
Outside beneath the body are two chicken coops with hinged swing back bottoms and two galvanized tanks for coal and gasoline.

The truck is equipped with an electric starting and lighting outfit which illumi-

nates the interior. An electric gong announces the approach to the house wife, and gives her time to get her purse and list of groceries ready. The car is heated in winter by the exhaust pipe.

A regular route on schedule time is maintained. A year ago this cash grocer car moved over a 15-mile route daily, but the service has grown so popular that it is now confined to a five-mile circuit with over 100 stops.

The stock in the truck comprises everything found in a modern grocery store and aggregates \$750 in value, leaving room enough for several hundred dollars' worth more if necessary. Goods are all put up in packages ready to hand out, with but few exceptions.

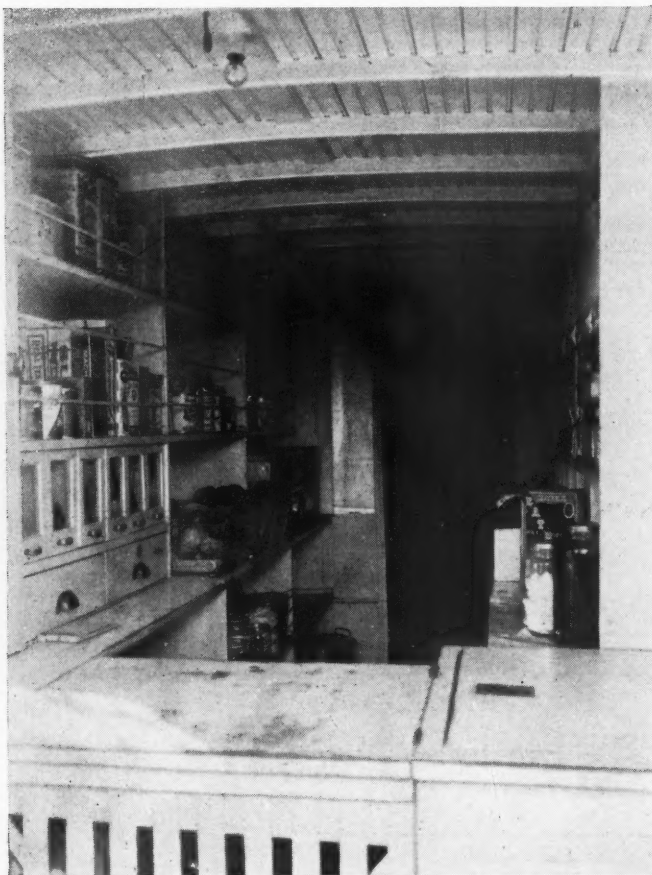


Ready to be Assisted up the Incline

Note the 6 x 6 in. back of the rear wheels



This Outfit Proved so Popular That the Owner Was Forced to Install a Light Delivery Car to Fill Phone Orders From the Operating Base.



ELECTRIC MOTOR AS FIRST AID TO TRUCKS

The electric motor is utilized as a first aid to motor trucks in the extensive excavation for the Pennsylvania Hotel, New York. In leaving the cellar, which is about 30 ft. below street level, the trucks are assisted up an inclined plane by means of two steel cables attached to the chassis in front. The cable is hooked on as the trucks halt at the foot of the incline, and when the driver starts his engine, the hoist engineer applies the additional power of his electric hoist. In this way the huge machines are drawn to the top, partly under their own power and partly by aid of the cable. At the street level the cables are thrown off and are returned to the excava-

tion by a descending truck. On the descent the cables are attached to the rear of the machine and serve as auxiliary brakes in case of need. It will be observed that on the ascent two men walk back of the truck, watching a 6 x 6 in. timber, which is dragged back of the rear wheels. They have hold of the rope that controls it, and it is their duty, in case the cable should part, to jam the timber against the wheels and keep the truck from sliding backward. This precaution is observed as the grade is about 30 per cent., and the consequences of a heavy truck with 12-ton load getting out of control, would be serious. The station of the hoist engineer is a small platform built to one side of the incline.



Car and Accessory Salesmen Attention!

\$500 in Prizes

Awarded for Directory Competition.

If you are a keen observer it will be easy money for you.

1st	Prize	\$200
2d	"	100
3rd	"	50
4th	"	30
5th to 10th, inclusive—\$20 each		

All you have to do is to ask the jobber, dealer, garage and repair man upon whom you call, which automobile directory he uses; send us the names of the dealers and the directories used, and letters containing the most good reasons why the trade thinks the **CHILTON AUTOMOBILE DIRECTORY** is best, most convenient and helpful to buyers.

Prizes will be awarded on the following basis:

To the largest number of names in the list of firms called and reported on—100 points.

For the letters with the best reasons—50 points; divided as follows:

NAMES				LETTERS			
Most—35 points				Best—15 points			
2d	—25	"		2d	—12	"	
3d	—20	"		3d	—10	"	
4th	—10	"		4th	—5	"	
5th	—5	"		5th	—3	"	
6th to				6th to			
10th	—1	"	each	10th	—1	"	each

This contest will start March 1st and will terminate June 1st. The contestant incurs no obligation. You do not have to subscribe to, contribute for, or buy anything.

For registration blanks and full details of the competition, write to The Contest

Editor, CHILTON COMPANY, Market & 49th Sts., Philadelphia, to send you blanks and full particulars of the \$500 prize offer.

This is a *real* opportunity. Let your impulse persuade you to write to-day, for now is the appointed time.

OTIS STEEL WHEELS AND WORM-DRIVE AXLES

That the Otis Elevator Co., 11th Avenue and 26th Street, New York City, manufacturers of elevators for over 60 years, should enter the field of worm drive axles and steel wheels, follows as a natural sequence in view of the wide experience of this company in making worm drives for elevator machines. Added to the prestige thus gained in the manufacture of worm drives are the facilities afforded by the modern electric steel foundries where both steel wheels and axle castings are cast, annealed and finished by the most scientific methods.

Otis Worm-Drive Axles

The straight type of worm has been adopted for Otis axles. In this type the adjustment is unimportant, except in a direction at right angles to the axis of the worm, and as this adjustment is positively fixed after setting, no harm can result. Otis axles, which are at present made in $3\frac{1}{2}$ and 5-ton sizes, both of which follow the same general line, are of the "full floating type" with a one piece casing extending from hub to hub. The one piece construction enables the casing to be made much lighter and of ample strength to take all stresses, without the aid of a truss rod. The casing is made of electric steel in the Otis up-to-date foundries, where scientific methods are employed. The castings are very carefully annealed to eliminate internal stresses, and accurately bored to receive and locate the unit worm carrier in its correct position. The axle extensions supporting the road wheels are of chrome nickel steel, heat treated, and forced into the casing under a pressure of fourteen tons. The worm gear is mounted as a unit, in a carrier of exceptionally stiff design, made from electric steel and is registered both top and bottom; the latter relieves the carrier of excessive stresses, due to heavy thrust loads, and maintains the correct alignment of the worm wheel bearings.

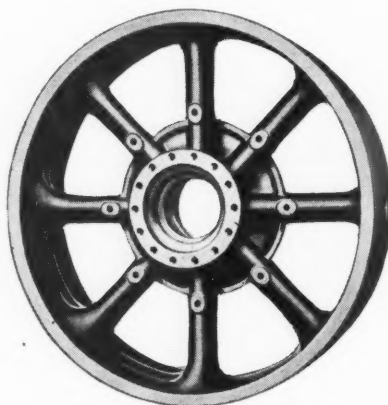
The worm is made from a forging of special nickel chrome steel with a form of thread which gives both maximum efficiency and strength; after hardening, it is ground on the threads by special machines to restore the theoretically correct thread form.

The worm wheel is made of a special bronze. The worm gear is supplied with

an all Timken roller or ball bearing mounting, at the option of the customer. The standard differential is of the bevel gear type; the case which is in halves is made of electric steel, machined on the outside to register in the worm wheel, to which it is secured. The gears are of heat treated nickel chrome steel of great strength. The pinions are mounted on a spider, drop forged from the same material, heat treated and accurately ground. If desired, a spiral gear differential of standard make can be fitted.

The drive shafts, which are subject to torsional stresses only, are made from chrome nickel steel and treated to obtain a very high elastic limit, and are of sufficient size to give a large factor of safety.

The brakes are of the internal expanding type, service and emergency, mounted side by side. Each shoe is mounted on its own



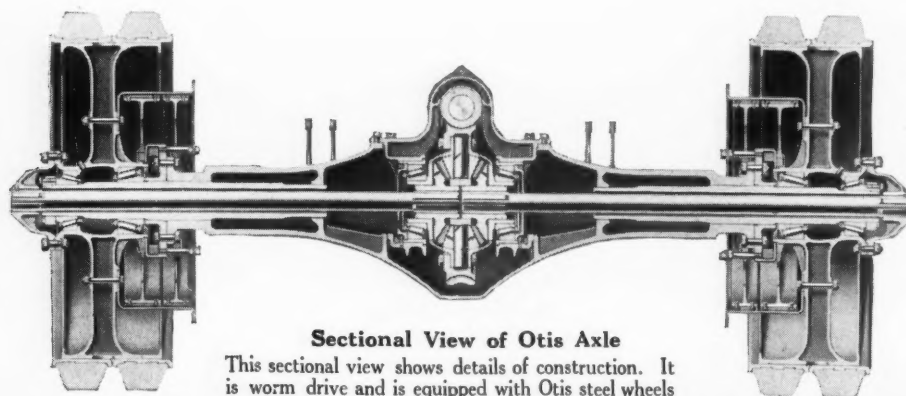
Otis Electric Steel Wheel

This wheel is for rear and has hollow spokes. It is built for $3\frac{1}{2}$, 5 and 6-ton trucks

pin to prevent "chattering" and is faced with high-grade wire woven asbestos, secured by countersunk copper rivets. The operating levers are drop forged of medium carbon steel, heat treated and fitted with hardened steel bushes, which may be easily renewed. The eyes are "S. A. E." standard dimensions. The whole brake is enclosed by dust plates, which may be removed without disturbing any other part.

The road wheels are mounted on Timken roller bearings of large diameter. These are supplied with lubricant through a plug located between them.

A filling plug is provided in a convenient position at the back of the axle and the



Sectional View of Otis Axle

This sectional view shows details of construction. It is worm drive and is equipped with Otis steel wheels

Everybody who is anybody in the truck industry reads the CCJ

level of the oil is controlled by it. Oil is carried up by the worm wheel and delivered through channels to the various bearings, insuring a constant supply.

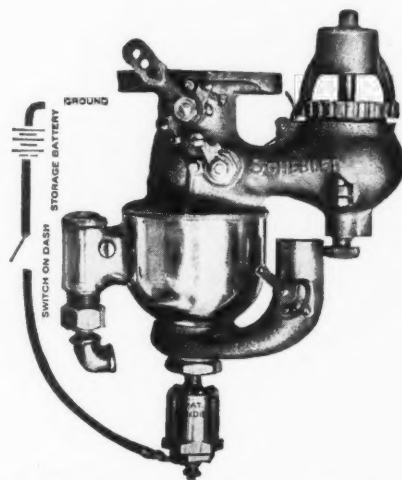
Otis Electric Steel Wheels

Otis electric steel wheels are made of one piece without joints or fastenings of any kind and the material used is electric steel. The castings are carefully annealed to relieve all internal stresses and are "seasoned" before machining. Every bit of steel used in charging the furnaces is carefully analyzed and proportioned to give the desired quality and test bars are poured during the progress of each heat.

The Otis Elevator Co. recently completed an order for 2,200 electric steel wheels, which they were competitively selected to produce under a weight guarantee which called for sections five millimeters thick and a mileage guarantee of 50,000.

DEVICE TO HEAT GASOLINE IN THE CARBURETOR

The E. H. Sprague Mfg. Co., 606 South 14th Street, Omaha, Neb., present to the trade the Thorwald Electric Carburetor Heater, which boils the gasoline, causing it to vaporize. Under this condition the engine should start easily, even in the cold of winter. By turning a switch conveniently located on dash the heater operates, and in so doing relieves the battery of a great strain. The manufacturers recommend the



Electric Carburetor Heater Attached

This shows the Thorwald electric carburetor heater attached to a Schebler carburetor

use of battery instead of dry cells on account of the great wear and tear on the latter.

The Thorwald electric carburetor heater is furnished complete, including cable and switch with full instructions for installing. Price \$5.

THE PENINSULAR RAPID TRANSIT Co., operating bus lines between Salisbury and Princess Anne, Md., has been given the contract to transport first and second-class mail between Delmar, Del., and the above named points.

10,000 miles— 80¢ for repairs ATTERBURY

THAT is what one Atterbury user has experienced.

“Without a superior”—is what you, too, will say about Atterburys, after you have sold them and have seen the satisfaction they give. For—business men who buy Atterburys soon find what real truck-economy means.

Have you seen the new Atterbury Book? Write your name on the margin below and we will send you a copy—gratis. If interested in dealer proposition, please say so.

ATTERBURY MOTOR CAR COMPANY
BUFFALO, N. Y. U. S. A.



When Writing, Please Say—"Saw Your Ad. in the CCJ"

TRUCK ACHIEVEMENTS IN THE CALIFORNIA SIERRAS

By FRANK REED

DURING the past summer motor trucks in the mountains of California have accomplished many things which were impossible in the days of horse and mule hauling. By impossible is meant physical impossibility as well as economic impossibility. They take in fresh vegetables that would be sun-dried, passengers who would never spare the time or undergo the inconvenience or horse travel and carry loads around the "hairpin turns" of the mountain roads that would tie a string of horses into a knot. In the line of industrial progress

equipped with an extra large distillate tank, 20 gal. water tank connected to the radiator through a pump which can be operated from the seat, ice-water chest for passengers, mail box and express package box. A gradometer is a very useful part of the dash equipment. The vehicle is equipped to seat 25 passengers and carry freight in the rear. Cackler usually hauls 2½ tons or more of freight besides passengers and their baggage through dust so deep that a test made on a 27 per cent. grade in the dust showed the truck would not roll down hill with the brakes entirely free. But he pulled up the grade, with the front axle leaving a 6-in. trail in the dust. He has carried as heavy a load as ten passengers with their baggage and 5 tons of freight. His mileage for the

every trip and keeps everything clean and properly adjusted and all bearing surfaces well lubricated all the time. He states that his load has averaged 5 tons to the trip, from the first to the last trip throughout the season. The turns on the mountain grades are so bad he has had to cut away some metal in the steering linkage so that turns could be made without backing up. He has not had the engine taken down or ground the valves. He has bought five tires; one rear Firestone made 12,000 miles.

C. A. Failing, of Llanada, San Benito County, Cal., is another truck operator who has made good in the mountains. He has a contract for hauling lumber to the New Idria quicksilver mine. Part of his route lies along a road cut out of a bluff, where he has but 6 in. clearance on a long, heavy, 42 per cent. grade which he makes all in low. Another of his difficulties is fording no less than 38 times a stream winding down the canyon.

This 4-ton Moreland truck is run with capacity loads inward, 24 hours a day over a route 65 miles long, making three trips per day, total 195 miles. The back haul is always made empty except for about 200 lbs. of quicksilver. The heavy load is carried up hill. Sharp rock in the road and creek crossings make this route very severe on tires. Previous to the use of the truck lumber was hauled into the mines by a wagon and trailer pulled by 16 spans of horses. This outfit would take 3½ to 4 tons into the mines in three days. It took two days more to get back ready to load again, and two men had to go with the outfit where one makes the round trip on the truck.

FIRESTONE TIRE & RUBBER Co., Akron, O., established complete facilities for the manufacture of rubber footwear. The company is also producing high quality fibre rubber soles and heels which are now being offered to the shoe manufacturing trade.



Mountain Stage With Special Equipment

Cackler's stage has equipment for carrying extra fuel and water, a gradometer, and extra strong body and top to hold the load on the grades and turns, that twist and tilt the truck.

the motor truck has put the hauling contractor in fine standing with the banking fraternity. Take the history of James L. Cackler, who operates the "Pines and North Fork Stage" out of Fresno.

Cackler as no green horn in the haulage business at the beginning of summer and, furthermore, he was a thorough mechanic. A summer resort on Crane Valley Lake is the basis for Cackler's summer traffic into the mountains. In the winter he hauls out wood and takes in supplies for lumber camps. The haul in a day with a truck put the place on the map. The chance to build up traffic was there, but the road was nothing short of a calamity. Cackler bought a two and a half ton Moreland truck "on time" on April 4, paid one-third down and agreed to pay the balance over a period of several months. Four months later a service man from the factory called on him and asked how the truck was making out in the way of earning payments as they came due. Cackler said, "Pay h—l, I don't owe you folks anything," and to prove it he showed the receipt for the price in full and bank book record of \$3000 deposit in the First National Bank of Fresno that the truck had earned him in the four months period.

Cackler has his truck equipped with a special top, which he built himself, to stand the racking and the load pressure on the terrific mountain grades. The body weighs 1873 lbs. with top and has 850 bolts in the top to establish its rigidity. It is also

season to December 1, when his truck was inspected by a COMMERCIAL CAR JOURNAL's correspondent, was 13,259 miles. He burns distillate with two gallons of coal oil poured into the fuel tank each time it is filled and uses only Valvoline oil. He puts the car up in his own garage, equipped with bench and hand tools, and takes care of it himself. He looks it over very carefully after



In a Village Near the Italian Fighting Front

Showing the mobility of the Italian army. The fleet of armored cars carry exceptionally large guns. Note the heavy metal work protecting the power plant of the truck

Merit wins—that's why the CCJ is the leader

Retail Coal Delivery Costs Reduced

Large Brooklyn Dealer Profits by Bettering Equipment

By C. P. SHATTUCK

THE average conservative business man is not likely to consider an investment in a motor truck unless the salesman can convince him that there are factors other than its greater speed and large load capacity that will obtain a satisfactory degree of economy. When the salesman can analyze the transportation problems of the prospect, determine the equipment that best meets the requirements of the business, and demonstrates the possibilities of economy with the truck, a sale is generally followed by a repeat order and within a reasonable length of time.

Last June a scout of the Brooklyn branch of the R. E. Taylor Corp., eastern distributors of the Garford trucks, reported a prospect in John F. Schmadeke, Inc., one of the oldest and largest coal dealers in Brooklyn. This concern, which has a large domestic trade as well as supplies factories, etc., employs a large number of horse drawn vehicles, and has an experience with motor trucks extending over a period of two years. The types utilized consisted of tractors and trailers of from 5 to 9-ton capacities, and these are largely used in delivering large, single loads, although 1 and 3-ton loads are frequently transported.

The transportation problems of the concern were carefully studied by Guy R. Chrysler, of the Brooklyn branch, and his findings were supplemented with cost figures of the equipment specially adapted for the conditions in which it was to be used, namely, the hauling of 6-ton mixed loads, a service not satisfactorily or economically performed by the large capacity trailer. By a mixed load is meant the delivery of 4

tons of egg coal to one party and 2 tons of pea to another, or three 2-ton loads to different customers.

The truck recommended was a 6-ton Garford, equipped with an automatic dumping body with three compartments of 2-ton capacity each. The sale was closed and the vehicle was placed in service on July 10, and it is interesting to note that the figures supplied by the Taylor salesman vary but a few cents as to the actual daily cost of operation.

The truck has been in continuous service since the date mentioned or 97 working days up to November 1, and on a basis of 26 days to the month has averaged 865 miles, hauled 673 tons and has been operated at a daily cost of \$10.89. This estimate does not, however, include any charge for tires, replacements or repairs, which are estimated and included in an accompanying table, which shows that the average daily cost is \$13.68.

The cost figures supplied by Richard J. Wulff of the company, omit tires and maintenance charges of repairs and replacements as the system devised by him will take care of these items in logical sequence. The truck is credited with \$25 for each working day, it being assumed that this is a fair estimate, as it would easily cost that much if a machine was hired or contracted for. All expenses are charged against the delivery account, and these items include fixed, mileage and maintenance charges.

Depreciation is charged by Mr. Wulff at 25 per cent., which is undoubtedly too high even if it were placed at 20 per cent. On a basis of 25 per cent. it is assumed that the truck will be worthless at the end of four

years, and it is hardly logical to assume that the truck will be worthless at the end of this time or five years. In the maintenance charges inserted in both tables these are based on an average for five years and it is not likely that such an amount will be necessary during the first or second year. As the cost will be greater during the succeeding years, the charge made is believed to be a conservative estimated average cost.

By charging depreciation at 20 per cent. and interest on one-half of the investment the average daily cost of operation is but \$13.12. Interest is charged on half of the investment only, because through the depreciation charge annually, the investment is

[illegible]

Driver's Daily Slip

A complete record is kept of mileage, tonnage, time, fuel, oil, etc., and the data is copied daily into a cost book.

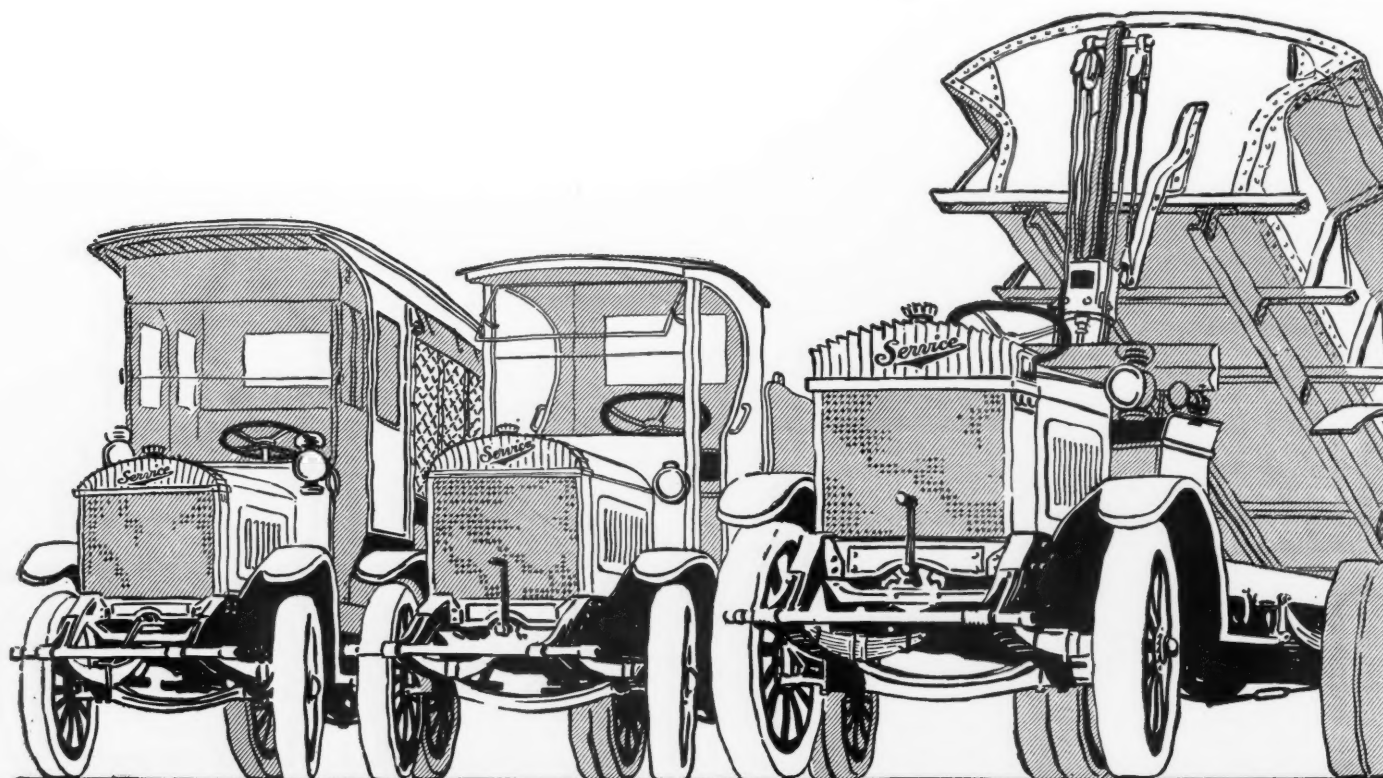
written off. In either case the truck is being credited with a saving of over \$13 a day or \$3500 the year. During the 97 days the truck has been in service, and accepting the figures supplied by the company plus the estimated cost of tires, repairs and replacements, the vehicle has effected a saving of over \$1100.

The average daily work of the truck is of interest and affords a comparison with the horse drawn equipment. To date the machine has averaged 121 trips monthly, carried 25.84 tons and averaged 33.26 miles daily. The average miles per trip has been 7.1 and the average tonnage 5.56. Working under the most favorable conditions a three horse team will haul 4 tons to a trip and make but four trips of 6 miles to the round trip. Unloading conditions and territory covered are factors that frequently mitigate against the possibility of the horse outfit, averaging four trips daily as above stated, particularly in the winter months. Ten hours constitute a working day with both types of vehicles. Figures relating to the cost of the horse drawn equipment performing a similar amount of work are not



Six-Ton Garford, Model 69, Effects Saving in Coal Business
Although the machine has been in service slightly over three months, a repeat order for six more trucks has been given

The CCI is built upon the lasting foundation of honest circulation



1½ ton model—suitable for general transportation for transportation companies, expressage and trucking where speed and low cost maintenance must combine in a vehicle of good capacity. \$1950.

2 ton model—a heavy duty truck of medium capacity combining the speed of the lighter models with the strength necessary to economical hauling of heavy loads. \$2250.

5 ton model—the largest Service truck displacing other trucks of heavier rated capacity in the handling of unusually large loads of extreme weight. \$4000.

Service Trucks Are Built in Six Models—1 to 5 Tons

10 Dominant Manufacturers Built Extra Well

Ten big motor truck manufacturers stand out prominently as those whose product finds biggest use among the large concerns who buy carefully. The stability of these ten manufacturers is assured—their combined capitalization is \$250,000,000; the value of their yearly output runs high into the millions. Each builds the best truck he can. Each offers guarantees backed by tremendous resources, tremendous manufacturing facilities, big strong organizations, established business reputation.

In essential specifications, established practice is closely adhered to. Eight build trucks in excess of four ton capacity. All build from one to four ton.

Yet with all the tremendous competition, with the tremendous manufacturing efforts to build the best, SERVICE motor trucks stand out among the ten with certain definite marked advantages of big value to purchasers.

Only one of the ten furnishes tires on all types that equal SERVICE in size.

Only one other is built to operate with perfect safety at the same high speed.

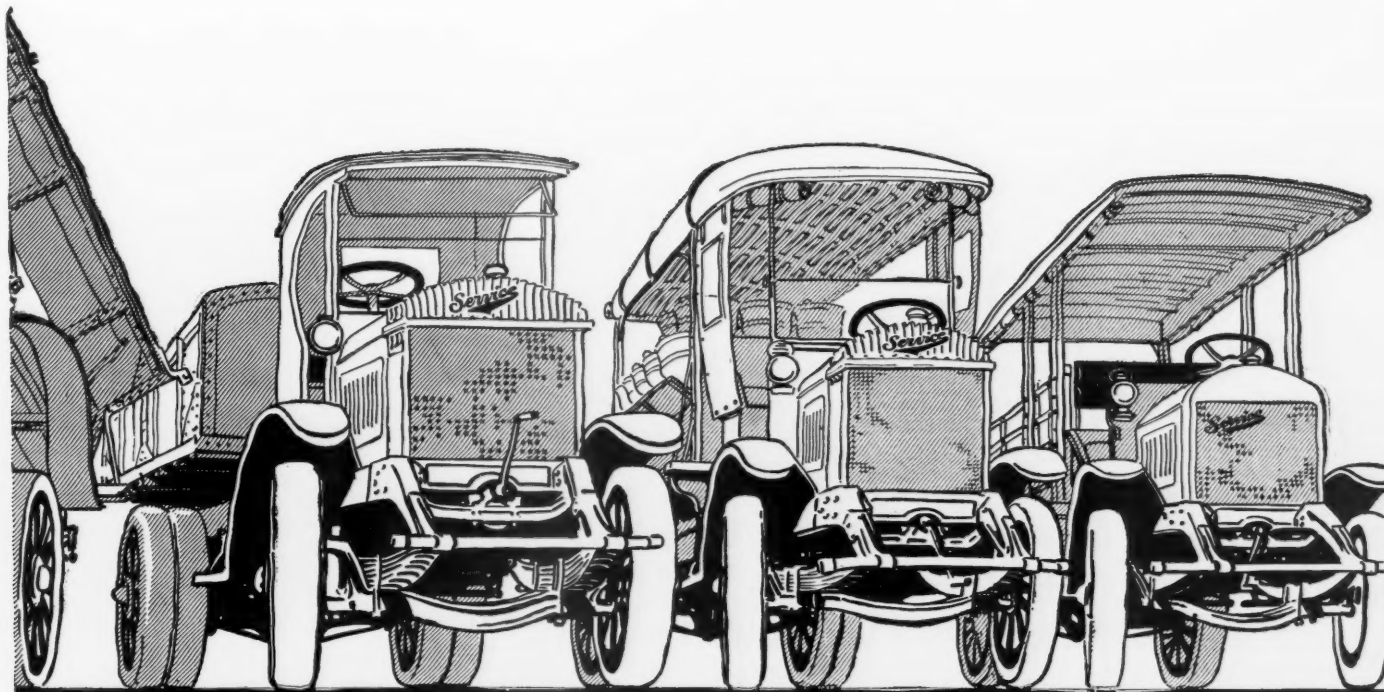
SERVICE is the only one of the big ten using the vacuum feed system, assuring maximum fuel economy, steady uniform fuel supply.

Eight use the worm drive, but SERVICE worm drive construction is the strongest that manufacturing ingenuity can devise.

Nine use pressed steel frames, but in the SERVICE motor truck pressed steel frame greater width of flange, depth of frame, more uniform distribution of load assuring maximum resistance to driving stress and strain, clinch SERVICE superiority.

Five use motors of same power as SERVICE, yet SERVICE shows a 11% higher rating than the other four trucks of equal load capacity.

In chassis size SERVICE gives greater loading length than any other of ten. This means a larger loading platform—greater carrying capacity—greater even distribution of load. Yet with these points of leadership and with every other feature of construction duplicating even the most expensive of the trucks manufactured by these ten big manufacturers, SERVICE presents a lower initial cost than any of the other nine.



3 1/2 ton special model—a contractor's truck with highly specialized specifications, including an over-size motor and superior strength on the frame for heavy trucking service. \$3250.

3 1/2 ton regular model—a heavy duty truck adaptable to a wide range of heavy duty service where sturdiness and strength must combine with satisfactory maintenance cost and low depreciation. \$3000.

1 ton model—admirably adapted for light, rapid delivery for a wide range of industries, unusually economical to operate. \$1375.

Service Trucks Are Built in Six Models—1 to 5 Tons

Service
Motor Trucks

Build Up a Real Business

60% of each year's business in Service Trucks is in repeat orders—you are sure of a 60% increase each year in your sales—without additional sales effort.

And all the time your new business is growing and duplicating—adding to your profits—to your business development.

Service Trucks are the choice of the biggest—the most careful truck buyers—of the men whose initial orders are most frequently the basis for future fleet equipment.

Ten Truck Makers Dominate in Sales—and among these Service Alone Shows Distinct Features of Real Superiority.

Compare constructional features—every detail of design—equipment—general specifications. The real advantages of Service—Built by Specialists—are at once apparent. Write for Our Big Dealer Proposition—it is a selling opportunity you cannot afford to miss.

Service Motor Truck Company

Main Office and Factory
Wabash, Indiana

Dept. U

Chicago, Ill.
New York, N. Y.
Baltimore, Md.
St. Louis, Mo.
Louisville, Ky.

Omaha, Neb.
Boston, Mass.
Brooklyn, N. Y.
Newark, N. J.
Indianapolis, Ind.

Buffalo, N. Y.
Salt Lake City, Utah
Milwaukee, Wis.
Bridgeport, Conn.
Des Moines, Iowa

Baltimore, Md.
Columbus, Ohio
Cincinnati, Ohio
Youngstown, Ohio
Canton, Ohio

Pittsburgh, Pa.
Washington, D. C.
Savannah, Ga.
New Orleans, La.
Hoboken, N. J.

Philadelphia, Pa.
Rochester, N. Y.
Tulsa, Okla.
Detroit, Mich.
Denver, Colo.

given, but it is interesting to note that it was stated that the costs of horse drawn equipment are steadily rising.

Mr. Wulff does not believe it is practical to utilize a driver of the coal teams for operating a truck unless he shows unusual ability. "A \$5000 piece of machinery is too expensive to experiment with and requires knowledge other than how to start, drive and stop it." The system for keeping track of the costs of the truck include a driver's slip. This is filled out daily and includes the operator's name, number of truck, date, amount of fuel, oil, etc., used, destination and time of arrival and departure at yard. The driver must enter the time he left the job, the miles traveled and tonnage hauled. These daily slips are copied into a record book.

Although the truck has been in service slightly over three months, the fact that the company has placed a repeat order for two similar trucks and for four 2-ton trucks, an order which enabled salesman Chrysler to win the monthly prize contest of the R. E. Taylor Corp., indicates that original purchase has demonstrated the economy of the truck in the delivery of coal. It is also interesting to note that the company is

erecting a \$25,000 garage, which, with the new machines, represents an investment of over \$50,000. While Mr. Wulff maintains that the horse drawn equipment is more economical for short hauls he believes that the truck with its greater capacity and speed makes possible covering considerable more territory and at a less cost.

97 days at \$25 a day.....		\$2,425.00
Gasoline, oil and grease....	\$211.46	
Driver	314.28	
Insurance	46.65	
Depreciation @ 25 per cent.	428.74	
Garage	55.87	
Tires	195.81	
Repairs, replacements.....	75.00	
	\$1,327.81	1,327.81

\$1,097.19

Average daily cost.....	13.68
Average daily saving.....	11.32
Annual saving	3,418.74
97 days at \$25 a day.....	\$2,425.00
Gasoline, oil and grease....	\$211.46
Driver	314.28
Insurance	46.65
Garage	55.87
Tires	195.81
Repairs, replacements.....	75.00
Depreciation @ 20 per cent.	319.20
Interest on half investment	51.99
	\$1,272.28

1,272.28

Average daily cost.....	\$1,152.72
Average daily saving.....	13.12
Annual saving	11.88
	3,587.76

Making the Truck More Efficient in Coal Hauling

Educational Campaign Among Coal Dealers Results in Greater Efficiency Secured for Truck

By H. L. CONNELL

EFFICIENCY and service are words that belong to the same family and we have on this page illustrations showing how the retail coal dealer may be made to appreciate this fact. The Sterling Motor Truck Co., of Mil-

waukee, Wis., has been carrying on an educational campaign among coal men on the efficient use of motor equipment and the

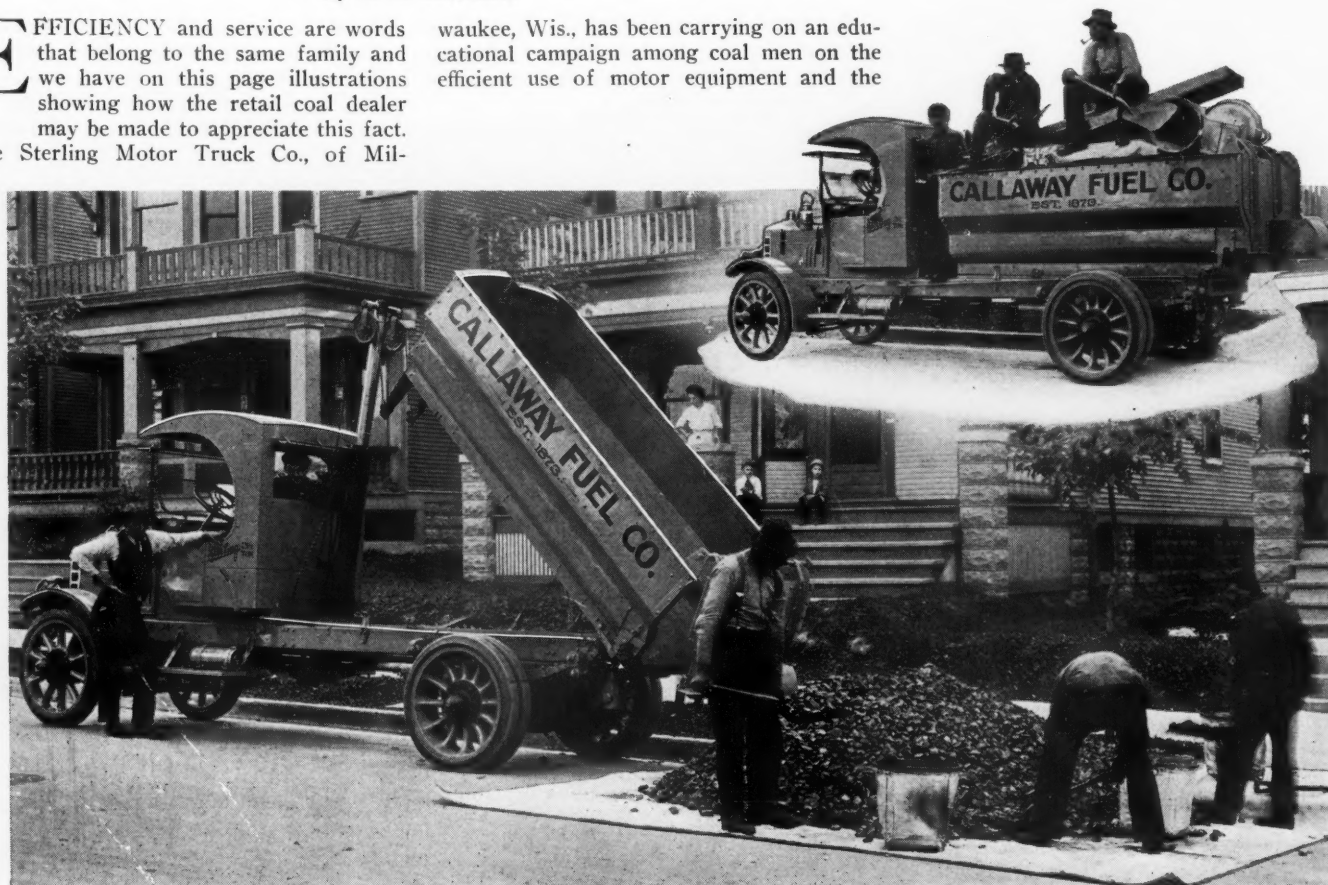
Callaway Fuel Co., of the same city, has proven a very apt pupil.

In the smaller view is the truck as it arrives at its destination with the coal chute, canvas bags and a big folded canvas sheet on top of the load. The first thing that is done is to lay out the canvas so that it covers part of the street, the curbing and part of the grass extension. If only part of the load is wanted it can be drawn from the flour bin type of chute at the rear, but if the whole load is to be left it is emptied through the swinging tail gate as the body is hoisted.

As will be seen in the larger illustration the canvas is big enough so as to take the whole load and thus protect the pavement and extension from the annoying coal dirt. This is something new in coal handling service and ought to pay dividends in increased trade. It means that the children will not be tracking coal dirt into the house nor will the man of the house have to spend an evening trying to hose the pavement back into a presentable appearance after the visit of the coal man.

For efficiency's sake the truck should not be allowed to stand idle while the men are carrying in the coal. With two gangs of unloaders it is possible in most cases to make the deliveries in one day in the same district, keeping the truck busy all the time.

VAN CORTLANDT VEHICLE CORP. has secured a plot of land at 642-50 West 37th Street, New York City, upon which will be erected a modern garage and service station.



Make your product pay—advertise in the CCJ